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ORIGINAL ARTICLES.

INFANTILE TUBERCULOSIS.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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NEW YORK CITY.

A very large number of tuberculous children seen in the course of the last ten years is my excuse for attempting to bring this subject before your honorable body for discussion. This subject is handled in a masterly manner in the text-book of Professor Baginsky, and I shall therefore follow his classification.

There is certainly a decided relationship existing between scrofulosis and tuberculosis, and thus most distinguished pediatrists believe the two diseases to be identical with one another. In fact, in studying the large number of cases of scrofulosis seen by me, it is more and more apparent that this disease is the stepping-stone to tuberculosis, and that one is the result of the other. In former years the text-books speak of the scrofulosis diathesis, and this latter condition we today recognize as the pre-tuberculous condition. The infant at birth that is put on an improper food is certainly a good subject for the development of rachitis and scrofulosis. In other words, the predisposing cause is certainly, in my opinion, greatly due to faulty nutrition, bad, foul-smelling, poorly ventilated apartments, and add to them all other factors which are combined in the words, "poor hygiene," then it is very easy to understand why a simply acute bronchitis and an otherwise mild form of whooping-cough will persist for months and ultimately develop tuberculosis. The two diseases which are most easily followed by tuberculosis are whooping-cough and chronic summer diarrhea.

There are very few today that deny that tuberculosis is caused by a specific bacillus, discovered by Robert Koch. The infectious character of this bacillus has so often been demonstrated, especially in adults, that we can also assume that this disease can be transmitted directly from parents to their children; the mode of transmission being usually by means of the sputum coughed up and allowed to dry in the apartments where children sleep. These live micro-organisms can, by being inhaled, cause direct infection through the air-tubes. We, therefore, regard this disease as an acute specific infectious disease, infection brought about by the introduction of the tubercle bacillus into a usually weakened or subnormal body with little resisting power, and hence the tubercle bacillus finds its proper soil, develops and infects and spreads until we have from a small focus in the beginning, a very largely distributed disease. The method or the way in which a patient contracts tuberculosis is so simple that it merely requires a word; recognizing, as we do, the infectious nature of tuberculosis, it requires but the dried sputum in the house of a tuberculous patient to transmit the bacilli through the air, which will lodge in the pharynx, possibly the larynx, and may even be carried lower down into the bronchi or alveoli, and in this manner enter and infect the lung.

The interesting studies of Cornet in regard to the transmission of tuberculosis are worth noting. How seriously this should be considered can be learned when we study the case reported by Wassermann (Virchow Archiv.), quoted by Professor Baginsky, in which a child six weeks old was infected with tuberculosis by coming in contact, in the same room, with a tuberculous man for only eight days. Lehman (*Berlin Klin. Woch.*, 1894, Nos. 26 and 28) details a series of six children that had been accidentally infected by intra-uterine inoculation. This must, however, be carefully considered before accepting isolated cases as definite results. Baginsky quotes a child from his experience, in which a tubercle nodule was transmitted by infection on the eyelid followed by suppuration. This was accidentally transmitted to the child from a tuberculous person. Demme, in the *Jahresbericht* of the Jenner Children's Hospital in Berne, 1889, and Deneke, in the *Deutsche Med. Woch.*, 1890, p. 13, discusses a series of children wherein tuberculosis was accidentally transmitted by means of bandages applied by tuberculous people.

That tuberculosis can be transmitted by the agency of raw milk from tuberculous cows is certainly not questioned, still it is surprising to note that even Koch does not always believe this to be the case. Boiling the milk suffices to destroy all means of infection. Demme reports an instructive instance in which a trained nurse suffering from lupus, transmitted and infected tuberculosis in children by means of handling their nourishment. When tuberculosis speads, it attacks every part of the body, so that none can be considered safe from its invasion. Many authors, among them Doutrelpoint, Lustig, Meisles, and Stricker, have found the bacillus in the blood and in the walls of the blood-vessels. It can also be found in the skin, where it forms irregular ulcerations or lupus. Demme has found the bacillus in the pus from an otitis. He also found the bacillus in the discharge exuding from eczema. Tuberculosis frequently attacks primarily the thymus, the heart, the pharynx and the peritoneum. Enteritis with tuberculous ulcerations opening spontaneously have been frequently reported by Baginsky. The numerous tuberculous joint affections with the suppurations of the bones are usually of a tubercu-

lous nature. Weigert believed, in a report made to the *Gesellschaft für Kinderheilkunde*, that the liver was a sort of receptaculum for this tuberculous virus. The acute form of general miliary tuberculosis is described by the French authors, Empis, Landougy, Aviragnet (Thése de Paris, 1892, de la tuberculoze chez les enfants, chapter 6, typho-tuberculosis). This is a masterly contribution to the subject of tuberculosis and will repay reading it. The so-called mixed infections are very hard to diagnose, unless we form a true clinical picture by these interesting observations.

Diagnosis.—The diagnosis of these diseases in infancy and childhood is by no means simple. In fact, it is extremely difficult, and can frequently be made by a process of exclusion. It resembles mostly typhoid fever, from which it can easily be differentiated by the absence of the diazo-reaction. Baginsky states that we must not rely upon the ophthalmoscopic examination, for the absence of tuberculosis in the choroid does not speak positively against depressence of miliary tuberculosis. He furthermore states that knowing the dangers of tuberculin injections in children, he warns against using the same for arriving at a positive diagnosis. The prognosis of localized tuberculosis is certainly good, especially so if radical surgical measures are instituted. It has also been proven, and postmortem examinations have fortified this clinical fact, that cheesy infiltrations in the lungs have been cured. Diffuse tuberculosis is, however, certainly fatal.

Cases of meningitis have frequently been reported as cured by Fleischman and others. This fact is doubted by equally prominent observers. Professor Baginsky declares that he has never seen a child recover from tuberculous meningitis. In my experience one child has certainly been greatly improved, although I do not believe that the disease is competely arrested. I firmly believe that under the influence of treatment, many symptoms otherwise prominent are now latent, and the child's improved condition depends on the same. It will take years of careful, close scrutiny to thoroughly test a single child with this terrible cerebral form of meningitis, before deciding whether it is really cured or otherwise.

Less than three years ago I published a paper on the treatment of pulmonary tuberculosis, based on a series of cases which I attended in the children's department of the New York Post-Graduate Medical School and Hospital (*New York Medical Journal* for Aug. 17, 1895). One of the children herein reported was 2 years old at that time. This case was reported by me at that time at the Post-Graduate Clinical Society, during a discussion of Dr. Crooks' paper on the value of creosote treatment in tuberculosis. It was really instructive to have this case report every Monday at my clinic, and to be able to demonstrate on a patient (what we have always wished for) theoretically.

Pulmonary tuberculosis frequently manifests itself without a cough, and if a cough be present without any expectoration, then we have a very different clinical picture in a child from that in an adult suffering with the same disease. We may have moist râles at times, a little harsh breathing and slight elevation of the temperature. Frequently there are small areas of dulness in the lung, caused by either consolidation or from enlarged and swollen bronchial glands. Then, again, I have seen cases of tuberculosis in which there have been no pulmonary symptoms on either percussion or auscultation, and where the clinical history was absolutely negative. In a case of this kind which I recall, the diagnosis of tuberculosis was made when the child suffered from a prolonged attack of diarrhea. An accidental examination of the mucopurulent discharge from the bowels showed almost a pure culture of tubercle bacilli, and thus the diagnosis was established.

The symptoms upon which we have relied chiefly in making a diagnosis have been loss of weight, disturbances with digestion, a slight attack of febrile malaria, besides constant irritability. Such children will frequently show very slight, if any, pulmonary symptoms, so that the diagnosis must be made by a process of exclusion. Such distinct diagnostic features as the presence of cough, expectoration and tubercle bacilli, dulness on percussion, with moist râles and night sweats, as we find them in the adult, are out of the question. How often do we have children brought to us with a distinct history of intermittent fever, lasting several months, and it is only when we can trace such a case back to a former infection of measles, pertussis or pneumonia, or to an infection of influenza, that our attention is directed to the possibility of there being a case of tuberculosis before us. Dulness on percussion over the thorax is so frequently due to enlarged bronchial glands that it must be borne in mind when suspecting consolidation; especially is this true in those forms of so-called scrofular enlargement. It is, therefore, to my mind not such an easy matter to diagnose a case of tuberculosis, and it is a safe advice to follow, "to observe a suspected case of tuberculosis for several weeks, and sometimes months before giving a positive opinion relative to either the diagnosis or more particularly to the prognosis in a given case." While speaking of the prognosis, it may be proper for me to say that it is always a wise plan not to commit yourself positively as to the outcome of any given case of tuberculosis, for frequently do we find a sudden hemorrhage appearing, which may end fatally in a short time, while our patient was apparently improving and giving us hope. On the other hand, let us not lose sight of the fact that a great many cases of tuberculosis (with cavities) have been cured. This has been proven by postmortem examinations many times. This I mention in order to demonstrate the necessity for extreme care in passing judgment upon a given case. My plan is never to call a case hopeless until I am positive that all means used for relief were hopeless.

Dietetic treatment.—The treatment consisted of supporting diet—giving a highly concentrated form of food in as small a quantity as possible. Thus, eggs and milk and expressed meat juice, and the farinaceæ are chiefly used. When children care for it, I frequently advise buttermilk and all forms of fermented milk; white meat, chicken, fish and shellfish, or broth made from the above at frequent intervals. So much for the dietetic treatment.

Medical treatment.—No drug that has ever been used has been found as efficacious as cod liver oil and creosote. The former I usually give in a 25 per cent. emulsion, and if the stomach tolerates it, I then increase gradually, giving a 50 per cent. emulsion, and if I find this well borne then I try the pure cod liver oil, giving a teaspoonful to a child under 5 years three times a day. If, however, the stomach will not tolerate cod liver oil, then I use it in the form of the bath, i. e., by inunction. My plan is to have the

child's body sponged with soap and water, then dry the skin thoroughly with a coarse turkish towel and rub the child's body, chiefly the chest and abdomen, for about five or ten minutes every morning. In this manner we can frequently have one ounce of oil absorbed into the circulation.

Creosote is certainly par excellence, the only drug to be used in this disease. While formerly we were restricted to the use of the ordinary beechwood creosote, within the last few years chemistry has given us the creosote carbonate. To Dr. Holscher of the Drei-Konigenhospital in Mulheim on the Rhine, belongs the credit of having discovered the value of this drug. In a letter recently received by me from the Doctor, he reiterates his former good results, and states that Chaumier and others have given as much as 30 grams per day. He also refers to the fact that Professor von Leyden reports giving from 5 to 25 drops of this drug three times per day.

My own experience with creosote carbonate has been limited to between forty and fifty cases. I usually give children of 1 year one drop, children of 5 years five drops three times per day. In other words, one drop for each year, until ten drops three times per day are given. There is usually a marked increase in the appetite noticeable, and a decided improvement in the cough, if any is present. Symptomatic treatment is not contraindicated, and urgent symptoms of whatever nature should be properly looked into.

Alcoholic stimulation requires but one word, namely, that if necessary alcohol should be used, but cautiously.

Hygienic treatment.—This, I consider to be the foundation for an ultimate cure if properly carried out. No medicine can equal fresh air and sunshine and cleanliness. The bulk of our cases seen in both dispensary and private practice occur in children living in tenement houses where just the conditions above mentioned are lacking. In a paper recently read before the Society for Medical Progress, of our city, Dr. W. Freudenthal dwells especially on the importance of sunshine and ventilation, if we attempt to cure a given case of tuberculosis.

I feel that I owe you a word of apology for attempting to speak on tuberculosis, especially in a region surrounded by climatologists and men whose lives have been spent in the treatment of tuberculosis. But I feel that infantile tuberculosis, as we frequntly see it in cases which are diagnosed as marasmus and allied troubles, are cases of tuberculosis.

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DISCUSSION.

Dr. SLAGLE of Minneapolis—I was pleased to find the Doctor in opening his paper stated the relation of scrofula to tuberculosis: that it is considered the tubercular diathesis. Two years ago, just the day before I was going to deliver a lecture on scrofula before the class, I received Dr. Rotch's work, and I was surprised to find that the terms struma and scrofula were not in his work at all and no explanation anywhere. I wrote to him in regard to it and he responded very kindly and courteously that in dropping those unscientific terms, scrofula, struma, colic, diathesis, etc., he was but following the suggestion of the American Pediatric Society. It was a question with me whether it was prudent to drop those terms and whether it could be done by any one man—they have been used so long. At any rate, it seems now that it is but a tubercular diathesis. Yet I have a paradox to state, which makes me suspect that its nature is not thoroughly understood. I have a large clientéle among the poor Russian Jews. Their children early are prone to those local manifestations which we have been accustomed to call scrofula or struma. Yet I have to state that it is a remarkable fact that they are comparatively immune from tuberculosis later on. Something has been said about that by some foreign writers and there has been an attempt to explain it. If we admit that the scrofula or strumous manifestations in early life make them immune later to tuberculosis, then we would have to deny what seems to be an established fact, that struma is but the tubercular diathesis. In regard to Dr. Fischer's treatment of tuberculosis in children, there is nothing to gain. Undoubtedly it is a disease of malnutrition, and undoubtedly good hygiene and good nutrition are of very great value. Undoubtedly the few remedies he mentioned: creosote, nux vomica, cod-liver oil and alcohol, are good remedies in well chosen cases. In regard to cod-liver oil, we find so many young children that do not digest cod-liver oil that I have come to prescribe the maltine with cod liver oil, rather than the emulsions of cod-liver oil, preferably the extract of malt with cod-liver oil and hyposulphites.

Dr. H. D. JEROWITZ, Kansas City—In reference to tuberculosis in children the fact is that very frequently a chronic pneumonia and a case of tuberculosis are easily confounded. A great many so-called cases of tuberculosis in children which recover are nothing more nor less than cases of chronic pneumonia or pneumonia in the third stage with pus or a pneumonia complicated with an empyema. A number of these cases, as we see, are caused by measles or pertussis, by malaria or typhoid fever, and owing to the decreased vitality, the pneumonia, instead of passing on to the resolution, proceeds to the chronic stage, and during this time the case presents the usual appearance of a case of tuberculosis, lasting all the way from several weeks to as long as five or six months. As a rule we think it is a case of tuberculosis that is beyond recovery, but the case gets well. The only way I know of differentiation is with the microscope and that is not always practicable with young children. We can not always get the sputum, and therefore in a great many cases it is often only a question of opinion as to whether it is a case of tuberculosis or pneumonia. So it seems to me a great many cases of supposed cure in tuberculosis are only cases of cure of chronic pneumonia. None of the remedies suggested are new. One of the chief remedial agents, I consider, is fresh air. The majority of these cases live in unhygienic and unsanitary surroundings.

Dr. ROSA ENGELMAN, Chicago—It is a question to me whether the Doctor has thought of the ante-fetal origin of tuberculosis, either through the sperm or an ovarian genetic origin. Another factor to which I wish to call attention, is the possible origin through what I have been pleased to call a scrofulous vaginitis. A great many patients come to me with what I believe to be a scrofulous vaginitis. By "scrofulous" I mean, as one of the gentlemen has recently said, a predisposition. Such children usually have chronic glandular enlargements and all the train of symptoms which cause us to make the diagnosis of scrofula.

Dr. HENRY E. TULEY, Louisville—I think the Doctor lays too much stress upon the presence of injury. I recall distinctly one case that presented itself at my clinic. There was no history of any heredity or injury. The patient was decidedly anemic, very much emaciated, and had a considerable accumulation of ascitic fluid. The mere suggestion of an operation caused the mother to withdraw the child from our observation. About five months later the patient returned again to the clinic and was entirely changed in character. During that time it developed that nothing had been done. There was no trace whatever of any ascitic accumulation nor anything that would lead one to believe there had been a tubercular peritonitis. But he presented himself to the surgical side for a tubercular arthritis of the knee-joint. This was of such a nature that an amputation was done at once, the

family consenting to this. The boy improved wonderfully in the next two months and has grown stout and strong. About four months later, a year and a half from the first observation, he returned with a cough and emaciation and there is now involvement of the apices of both lungs and microscopic evidence of tuberculosis. These cases present such peculiarities that it seems to me the importance of the variety of symptoms should be impressed upon us. Another thing the Doctor mentioned in passing is the presence of a subnormal temperature in tuberculosis. I would disagree with him in regard to that, having made observations in several cases, one especially, which I reported with a forty days' record of the temperature, with a high temperature each day, never reaching normal for several weeks before the signs were present in the chest, the child finally dying of a tubercular pneumonia, the autopsy proving the diagnosis. I think more often these cases have high temperatures than they have subnormal or low ones.

Dr. MCCONNEL, of Kansas—With children, especially, it is very difficult to continue for any length of time the internal administration of any preparation of cod-liver oil, in emulsion or any other form. Inunction I have found a very useful method of using cod-liver oil. It can be applied twice daily over the abdomen and chest of the child, and the child will tolerate it better that way often than in any other way. Dr. Lawrence mentioned rarely finding the condition in males and also rarely finding it idiopathic. I wish to mention a case of a young man with tubercular peritonitis, the origin of which was traced to an injury received from a fall off a bicycle. That is the only instance I have encountered in which it came in that way. About ten weeks previous to this case applying for medical aid, the boy gave a history of having fallen from a wheel and struck on the right handle of the bicycle in the right iliac region. The pain was so violent that he said he fainted and was unable to stand or walk for several minutes. From that time his health began to decline, his appetite failed and he became emaciated, thin and anemic. His parents became solicitous for his welfare and consulted several surgeons. There was considerable diversity of opinion in regard to his ailment. Some considered it peritonitis. Until an operation was performed, the character of the case was not cleared up. There had been a general peritonitis of the abdominal cavity, but the appendix was not involved. The adhesions were many, both of the mesentery and the intestines. A laparotomy was performed and drainage used, which greatly improved the child's condition. That has been three months since; he is not well to-day, but he has improved.

Dr. H. B. WHITNEY, Denver—In regard to Dr. Lawrence's paper, I agree with him, especially as to diagnosis. I think he has laid stress where it should be laid, especially on the pain where there is much emaciation, the slow development of ascites, and together with that it seems to me is very common the presence of masses of induration or irregular tumor masses here and there scattered over the abdomen. These things have seemed to me to be of great importance in the diagnosis of tubercular peritonitis. I would also like in this assembly to lay special stress on what seems to me to be an unquestionable fact, and that is the comparative immunity of children of tubercular parents here in Colorado. I merely wish to suggest to you very earnestly whether it should not be more carefully considered as to the sending of children here to Colorado, who are strongly predisposed to the development of tuberculosis. We do here see a certain number of affected joints and some cases of peritonitis, but in the main children here grow up with a decidedly less predisposition to tuberculosis than elsewhere. Where the parents of the children have not developed tuberculosis to such an extent as to compel them to go to Colorado, it seems to me we should consider very carefully whether it would not be wise to send them to Colorado for the sake of the children.

Dr. EDWIN ROSENTHAL, Philadelphia—In the institution with which I am connected, little children picked up on the streets, died in a few days and on postmortem I found nothing at all but tubercular peritonitis. Further dissection revealed only an enlarged lobe in the lungs. These were little infants that probably perished from exposure and neglect. In this home we receive all sorts of children found on doorsteps and so on. This brought me to think that the condition of tubercular peritonis is found in infants perhaps more often than we give credit for. The so-called inflammations of the bowels are often of tubercular character. Tubercular peritonitis follows measles as well as whooping cough, and when we have cases of whooping cough or measles that have recovered, we must not discharge the patients too soon, for they are never thoroughly well until months afterwards. In fact, we should keep them under observation for at least six months afterward. In the case of simple whooping cough, which the Doctor said, if it had any hereditary history, might turn out to be a case of tubercular gland disease, and would end in tubercular disease; if it were a case that had a tuberculosis for an inheritance, it would easily turn into tuberculosis of the knee or hip-joint, and the proper etiologic factor would be such diseases as whooping cough or measles.

Dr. LOUIS FISCHER, New York City, in closing.—In reference to the remarks of the gentleman who found so many cases among the Russian Jews, I believe that is true because they adhere so closely to the Biblical teachings. It seems they have a certain form of inspection which is a sanitary measure. They inspect the bronchi and lungs of all animals slaughtered, and if they find nodules and disease, or if they can not inflate the lungs, the animal is rejected. Unfortunately, those of us who have strayed from that practice are as prone to that disease as anybody else. I purposely went into the matter to find why people with external manifestations of the disease did not develop tuberculosis, and I believe it is simply because the vital factor is not introduced, namely the tubercle bacillus. The gentleman stated that where cod liver oil was not tolerated he gave malt. I am heartily in favor of giving malt, but the same objection open to cod liver oil is open also to malt, that where the stomach will not tojerate cod liver oil it will not tolerate the action of malt. For that reason I have discarded the use of malt. When I was associated with Dr. Chapin of New York, I noted the weight of children taken before and after inunction. Nothing was given but cod liver oil externally, and we were surprised to find how much good could be done in that way. Dr. Jerowitz of Kansas City mentioned the fact that it is difficult to get the sputum of children in order to make a diagnosis. I remember one case at the Post-graduate, in which we were baffled in making a diagnosis. The child had a slight elevation of temperature. It was one of the cases in which we suspected the possibility of intermittent fever. We examined the blood and found no plasmodia. On examination of the lungs no evidence of tuberculosis was found, yet examination of a little mucus discharged from the bowel showed the tubercle bacillus. The guaiacol treatment is one I use also. Fresh air was mentioned and I mentioned the value of sunshine. In fact I was very anxious to hear Dr. Whitney's views of the value of the climatic treatment, for which my paper was purposely intended. The Doctor stated that he found a certain immunity among children in this climate. I believe we could secure the same immunity if we had continuous sunshine and fresh air and the value of pulmonary gymnastics. I believe where we have little girls from 6 to 10 years old in the East, by making them inspire and expire in the parks, we do more good than by any other means. I do not believe the drug treatment of tuberculosis is the real treatment; but sunshine, fresh air, massage, anything plus oil, plus nutrition, are the vital factors in the treatment of tuberculosis.

Dr. F. F. LAWRENCE Columbus, Ohio, in closing.—I believe

I stated that where we had ascites in the absence of heart, kidney or other visceral lesion, which would give rise to ascites, that is presumptive evidence that the peritonitis is tubercular. I agree with my friend from Louisville that there are a great many cases not of tubercular character. In regard to aspirating, I do not use the aspirator at all about the abdomen. I do not like to think that I may plunge the aspirator needle into a loop of intestines and have to make an operation to close the opening. Like a great many things (Kentucky whiskey, for instance) it is all right in its place. In regard to the remarks of my friend, Dr. Tuley, who said, I believe, that I laid too much stress on injury, I said that in cases in which there is a tubercular affection in some other part of the body there may be no injury. I still say and believe that it will almost if not quite universally be found that there is some mechanical injury to the abdomen some time before. As to when we should commence treatment, the time to begin active treatment in tubercular peritonitis, that is when to operate, is just as soon as we are satisfied that we have a chronic peritonitis, whether tubercular or not. We are not justified in taking the chances of the effusion becoming absorbed and the patient recovering, when an incision and drainage is practically without danger. The whole subject of tuberculosis is unsatisfactory so far as its curative treatment is concerned. Tubercular peritonitis in children is much more likely to be severe and is likely to follow upon some tubercular condition in some other part of the body.

SOME DISEASES COMMON TO THE FEEBLE-MINDED.

Presented to the Section on Diseases of Children at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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I count not the least valuable to myself of my former collaborations with the late Dr. Isaac N. Kerlin a study that we made together—with intent of reducing to tabulated form—of those diseases most common to the feeble-minded. This study involved the examination of medical records of 1400 cases, covering a period of twenty-five years, and I have since extended it so as to include some 3000 cases. Sifted out, we find the diseases, some eighty in number, distributed equally among the sexes, and in varying proportion in the different grades. Broadly considered, there are three conditions or classes which the feeble-minded present to the eye of the medical observer, with modifications of course in different grades, causing the individual, therefore, to repel or to succumb to disease each in a different way. We have, first, a physical development according to age, susceptibilities to pain or pleasure being almost normal, and the mental development fair, but limit reached in early youth; what we would call mentally feebly gifted but physically normal, meeting disease much as do normal people under similar environment and with average longevity. Second, are those undeveloped in mind and body, as the cretins, for instance, predisposed from birth to certain forms of disease and an easy prey to any.

In marked contrast are those who exhibit almost entire habitude to pain, able even to endure amputation without flinching and rather enjoying anything that gratifies the egotistic sense or that brings the individual into notice. He is ignorant of pleasurable sensations, absolutely devoid of sympathy with his kind, and being absorbed in self, his thoughts are constantly inverted. It is from this class that many of our criminals are drawn. For them the gallows has but few terrors and they suffer the extremes of heat or cold, and even the pangs of hunger, without the consequences common to those of ordinary type.

Lastly, those physiologically old, who either wear out in childhood of "old age," or else, as old people too feeble to resist sudden attack, die in youth or early childhood. Included in this class are those who seem made of such poor material—whose tissues necropsy reveals as absolutely worthless—that they are unable to resist disease or any nerve storm, and simply go to pieces. Reviewing these peculiar types the physician ceases to wonder at various apparent anomalies one constantly encounters in our hospital wards. Here one falls and passes away from slight cause that would hardly affect a normal babe, another, at the very gate of the grave, with hardly a pulsation or a breath, will suddenly revive and recuperate as a normal person could hardly do.

The major nervous diseases, such as Friedreich's ataxia, syringomyelia and hydromyelia, which one would naturally think allied to brain diseases, are practically unknown. Anterior poliomyelitis is occasionally found, but the most common nervous diseases are the cerebral palsies of childhood. Meningitis is also common and confined almost exclusively to boys of the high and middle grades. Hysteria is peculiar to these grades, but occurs most frequently among the girls, as do the various neuralgias. True chorea is rare and found not at all among the lower grades, and only in about 5 per cent. among the higher, although choreiform movements are fairly common. Epilepsy claims about 20 per cent. of the feeble-minded, chiefly of the imbecile and idio-imbecile class, and is seldom seen in the idiot, either apathetic or excitable.

There is much hereditary predisposition to lung troubles which, coupled with lack of resisting power, renders such complications as phthisis and pneumonia inevitably fatal. Asthma, bronchitis and pleurisy are not frequent, nor is laryngitis, while tonsillitis, pharyngitis and rheumatism are common among all classes, the latter among the boys of the higher grades. Ephemeral fever occurs with the temperature running so alarmingly high that fatal results seem inevitable, and then as suddenly subsides in response to the simplest remedies.

Cutaneous affections are rare among the high and middle grade imbeciles, though frequently met with in the low grade and idio-imbeciles, due doubtless to inertia and the sluggish and unclean habits that characterize these classes. Eczema is common, lingering and persistently returning in spite of most careful treatment. Rupia escharotica, tinea, acne, alopecia, impetigo, herpes, erythema nodosum and urticaria are among the list of cutaneous diseases. Acne sebaceum or "butterfly disease," of which but twenty cases, including three of my own, are reported, seems to be confined exclusively to the lower grades of mental defectives. Ulcers are frequent, especially on the upper and lower extremities, and are obstinate in responding to treatment.

The sluggish habits of these children find the usual results in constipation, dysentery, diarrhea, dyspepsia and gastritis. Gastric ulcers are found occasionally among the boys, with the girls never. Enuresis is common among all grades and is often incurable. Hemorrhoids are rare among the lower grades, but

are common among the higher grades of both sexes, as are also hernia and prolapse of rectum. Deficient circulation is almost exclusively confined to imbeciles of the lower grades; thus cyanosed hands and legs and blue lips are characteristics of the idio-imbeciles, as also of the grades of the Mongolian type, who often develop scrofula. Syphilis is rarer among the feeble-minded than is generally supposed.

Defective vision due to errors of refraction is found among 90 per cent. of the high and middle grades, and among the low grades there is much conjunctivitis, iritis, corneal ulcer and blepharitis. Tests and also class work in the schools reveal a fair possession of color sense, and color blindness is the exception rather than the rule.

Absolute deafness is equally uncommon even among the members of the idio-imbecile and idiot class, although partial deafness is occasionally met with. Both sexes are subject to otorrhea, and especially to otitis media. Hematoma auris is met with in 25 per cent. of boys, and is confined almost exclusively to the left ear. I know of but one case double. Adenoid growths are a fruitful cause of the speech defects found in the high and middle grades, and their early removal greatly facilitates that training in articulation which holds an important place in all schools for defectives.

This rapid résumé of a subject of which the limits of this paper will not permit more than a glance may, I trust, be the means of eliciting notes of similar experience from others engaged in work among the mental defectives. These collected may in time form a sound basis of theory such as may aid materially in the practical work of the future in our hospitals.

ARTIFICIAL FEEDING OF INFANTS, ESPECIALLY IN GASTRIC DISTURBANCES.

[ABSTRACT.]

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., July 7-10, 1898.

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Gastric disturbances of infants are due mainly to improper food. The food may be at fault in quality or quantity. Rarely cases of congenital malformation or deficiency are met in which the usual food preparations do not agree. If the disturbance is caused by the food and is not due to some deficiency in the baby's stomach, the first inquiry regards the source of the food. If the food is mother's milk, the health and temperament as well as the disposition of the mother must be observed. If the mother's milk is acid the administration of a little lime water to the baby after each nursing may remove the difficulty. Mother's milk may contain too great a relative proportion of proteids and constant functional disturbance in the baby's stomach arise. In this and other cases mother's milk may have to be abandoned and some form of artificial food prescribed. If the disturbance has continued until organic injury of the stomach has supervened (as chronic gastritis) additional modifications of food may be required. The food may require complete or partial predigestion or peptonization. Under such circumstances it is often a long and tedious task to find a preparation of food which will entirely remove the condition and relieve the symptoms.

Next to mother's milk, cow's milk is the proper food for infants. This must be modified so as to correspond to mother's milk. Each case requres special investigation. If there is constipation and a poorly nourished condition of the patient, cream should be given in larger proportion than in cases of well nourished infants, with a tendency to diarrhea. Bearing in mind the fact that normal human milk is alkaline while cow's milk is neutral or acid, a necessity will be recognized for using a little lime water with the cow's milk. Sterile milk should be used. If proper precautions have been taken in milking the cow and the milk is passed *at once* into sterilized bottles, a healthy cow's milk *is sterile* and needs no heating except to raise it to proper temperature for feeding the baby, about 98 or 100 degrees F. The milk must be analyzed, and then by comparing with normal human milk a formula can be given and the milk prepared as needed.

Human milk contains water 88.4 per cent., fat 4 per cent., lactose 6.5 per cent., proteids 1.8 per cent. If a cow's milk is found to contain water 87.3, fat 4, lactose 5.69, proteid 2.80, a simple calculation shows that to reduce the cow's milk to the equivalent of mother's milk it is necessary to add 57.1 per cent. of water. To prepare 500 c.c. of this modified cow's milk from the specimen here given will require 312 c.c. of milk and 178 c.c. of water (174 water and 4 lime water). To this must be added 9 c.c. of cream and 10 gm. of lactose.

When it is not convenient to analyze the milk, a good average food may be thus prepared: Skimmed milk 300 c.c., water 166 c.c., cream 30 c.c., lactose 8 gm., lime water 4 c.c. If constipation occurs, increase the proportion of cream; if diarrhea, reduce the amount of cream or increase the proportion of lime water. Sometimes colic and even diarrhea may be caused by the proteids in cow's milk and it is found necessary to reduce the quantity of milk and increase the proportion of cream.

It occasionally occurs that summer heat, or some condition of the stomach, may cause such digestive disturbance that cow's milk must be totally discarded. When such is the case, evaporated milk, malted milk, malted meat, milk food, and similar commercial preparations may be tried, selecting with a view to the conditions prevailing in individual cases.

SOME PERSONAL EXPERIENCES IN INFANT FEEDING.

Presented to the Section on Diseases of Children at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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There is no question in pediatric medicine which at the present time is exciting more interest, and justly, too, than the subject of artificial feeding of infants. Where the mother has well developed breasts, containing a plentiful supply of good milk, the question of infant feeding is an easy one, and it

is not the object of this paper to discuss the question of breast feeding, or even to touch upon the manner by which, as far as our knowledge at present reaches, the lacteal secretion in the breast can be modified by food and general hygiene. It is our intention to dwell in a brief manner only on the subject of the feeding of infants by artificial means, first, by foods derived from the milk of the cow or other animal; second, by foods made more or less directly from the grains. In the study of this question we have made our observations chiefly in the infant's clinic of the Polyclinic Hospital of Philadelphia, as district physician among the poor in one of the most populous parts of that city, and also among our private patients.

The indications for the withdrawal of breast milk and the adoption of artificial feeding are that whenever the mother or child is suffering from a continuance of breast feeding, the child should be weaned. As special indications we would mention syphilis, either in the mother or child, tuberculosis or other wasting disease, and any of the exanthemata in the mother. Pregnancy and menstruation frequently so alter the composition of the milk as to require weaning. Hard work, poor food, and general bad hygienic surroundings may render the mother's milk unwholesome for the child. Whenever the milk is below par in quality, this being evidenced by less than the normal gain in weight from week to week on the part of child, or where the breast milk for some unaccountable reason disagrees with the child and can not, after a reasonable attempt, be so modified as to suit the digestive organs of the infant, the latter should be weaned. Women with uncontrollable nervous systems make, as a rule, poor nursing mothers, so that this alone may be a cause for the substitution of artificial feeding. Occasionally we find infants whose digestive systems are too weak to assimilate their mother's milk; these children generally thrive better on modified cow's milk than from the milk in their mother's breast. With our increased and more accurate knowledge of infant feeding, especially by the use of modified milk, the scope of what is generally known as artificial feeding is so widened that we often find an infant will thrive much better when fed by this means than from breast milk. In discussing the subject of infant feeding we will briefly consider: 1, feeding by the modified milk of animals, particularly the cow; *a*, cow's milk modified at home; *b*, cow's milk modified in laboratories; 2, Gaertner's so-called fatty, or mother's milk; 3, condensed milk; 4, proprietary foods.

Modified milk.—The milks of many animals, notwithstanding quite marked differences in the proportion of their chemical constituents, may be so modified as to closely resemble the milk of the human female. It must, however, at the same time be borne in mind that the digestibility of the mixture does not entirely depend upon the fact that the proportion of the various elements (fat, sugar and proteid) may be so arranged as to closely resemble human milk, but the character of these elements must be as near as possible to the latter. Thus, as everyone knows, the proteid of cow's milk is far less finely divided and is tougher and less flocculent, when precipitated by hydrochloric acid or rennet, than is the proteid of the milk of the goat or of the human female. The proteids of different breeds of cows also vary; thus the Devons, Durhams, Ayrshires and Holsteins, give milks the proteids of which are more finely divided, not only as regards their division in the emulsion of the milk, but also in the precipitated proteids, than the same elements in many other breeds of cattle, notably the Jerseys. The fat of milk must also be in nearly as fine a degree of subdivisiyn as is found in human milk, and in this the milk of animals differs much; even among various breeds of cows there is found a wide difference; the Holsteins, for instance, giving a much finer emulsioned milk than probably any other breed. As a rule a breed of cow noted for giving the best milk for buttermaking is not the best for infant feeding, because the milk which makes the best butter is one with large fat globules, i. e., a coarse emulsioned milk, while as we before stated, a milk for infant feeding must be in a state of fine subdivision, in other words a fine emulsioned milk, As in by far the largest number of cases we are compelled to depend upon the cow to act as a foster mother for the human infant, we will only take the time to merely *touch* upon the question of the milks of other animals.

Goat's milk is often of great service in infant feeding; the animal is easily obtained, is not expensive, and is not hard to keep. Its milk is well taken and assimilated by infants. It is also capable of considerable modification. An analysis of goat's milk which the author had made shows the following proportions of its constituents:

Goat's milk.—Fat 5.85; proteids 4.49; sugar (lactose) 5.11; mineral matter 0.88; water 83.67.

This is to be compared with the relative proportions of fat, proteids and sugar in cow's and human milk.

Cow's milk.–The Walker-Gordon Laboratory Analysis —Fat 4; proteids 1; lactose 4.50.

Or human milk, same analysis: Fat 3; proteids 1; lactose 6.

It has been the author's experience, however, that in goat's milk the toughness of the proteid elements and their divisibility, vary more with the diet of the animal than do the proteids in cow's milk. Ass's milk is said to prove satisfactory, but we have had no experience whatever with it. Various preparations of milk, such as Koumys, Kephir, etc., we have used but seldom. These undoubtedly have some use for the nourishment of infants with feeble digestion, but their long continuance can not be recommended. In view of these facts we return to the consideration of cow's milk.

The composition of cow's milk differs considerably from that of the human female. In the former the proportion of proteids is considerably higher than in human milk, and the character of the casein is tougher. The proportion of fat is nearly the same in both; possibly somewhat larger in cow's than in human milk. There is, however, such an enormous difference in the analyses of cow's milk made by various observers that it is extremely difficult to get a standard test upon which to base our calculations. The proportion of sugar is decidedly higher in human than in the cow's milk, and the degree of alkalinity is slightly greater in the milk of the human female. The object in modifying cow's milk is to bring the proportions of the various elements as nearly as possible to those of human milk. Thus we add water in order to dilute and thereby decrease the considerable excess of proteids, but as in so doing this the sugar and fat are reduced below the proportions

found in human milk, we must add these elements in the form of cream and sugar of milk or cane sugar. This is the fundamental principle for modifying milk. Milk in some form is undoubtedly the food for infants, as during the early months of life the starch digesting functions of the digestive organs, while perhaps not absolutely undeveloped, are incapable of continued action. Allowing then that milk is the best food for infants, and that cow's milk can be so universally obtained, we consider that modified milk is the simplest and cheapest food that can be used, and in our experience its results are far superior to any patented infant food. It is also capable of an almost endless variety of changes in the proportions of its principal constituents, and on this account it can be adapted to the digestive organs of almost every infant, if only a little care in the study of the case is exercised. The next question is, how milk should be modified. The proportions of the various elements must be arranged to suit the digestion of the individual child that we are treating, and frequently many changes must be made in the modifications before the desired result is obtained. We have arrived at the desired point when a child previously illy nourished gains as does the average breast-fed baby, of the same age and in good health. As a pioneer in this branch of medicine the profession owes a large debt to Professor Rotch of Boston, and it is upon his most carefully computed tables that most of the scientific knowledge of the use of modified milk for infant feeding is at present based throughout the world.

Home Modification.—In treating the subject of home modification the author intends giving more of his own clinical experience than to the consideration of the subject as found in accurately compounded tables based on calculations involving a deep knowledge of high mathematics. We have not infrequently seen these demonstrated at society meetings, and in journal articles as being "short and easy methods of calculating the proportion of the various elements of milk." In many cases these short methods occupy one or two blackboards, or two or three pages of a journal article in the working out. The knowledge of the average mother does not extend this far, neither has the general practitioner time to spend all of one set of office hours in working out these problems. However, a thorough knowledge of the method of computing these formulæ should be well understood by all those who are special students of pediatric medicine. In our own experience it seems to be most important to get some formula as a basis, and to vary the proportion of the elements therein until a modification is obtained, which will suit the digestion of the particular case we are treating. We can make few general rules in infant feeding; each patient must be studied from its own standpoint. In our hospital work we are in the habit of taking as a basis a prescription such as the following, this being one of Rotch's formulæ: Proteids, 1.00; fat, 2.50; sugar, 6.00; lime water, 5.00.

This can be made as follows: allowing that the cream furnished the average household does not contain over 10 per cent. fat, and this generally happens: Cream, 5 oz.; milk, none; lime water 1 oz.; water, 14 oz.; milk sugar, 8½ teaspoonfuls. In this formula we purposely kept the proportion of fat and proteids rather low, to allow for the greater toughness of the cow proteids. This milk mixture we are in the habit of giving Pasteurized, that is, heated to about 170 degrees F. The quantity for a child of three to five months is usually from four to six ounces, and the interval of feeding every three hours during the day (from 5 A.M. to 10 P.M.) and once during the night. It is of the utmost importance that a baby be fed at regular intervals, and if the child is asleep when the feeding time comes it should be awakened. If the above formula agrees it should be continued as long as a suitable gain in weight occurs, and the digestion remains in good condition. As a rule we are in the habit of increasing the proteid and fat and decreasing the sugar as the child grows older. Should any symptoms of indigestion arise the proportions must be changed. A little study of the subject will quickly tell us which one of the elements is at fault. It is only necessary to call your attention to the fact that where the proportion of proteids, for example, is too high the child will have colic, irregular attacks of diarrhea and constipation, the vomiting of curds and curds in the stools, or where the proportion of sugar is too high there will generally be frothy stools, acid in reaction, frequently producing considerable irritation of the parts around the anus, etc.

For home modification among our out-patient infants in the Polyclinic Hospital we generally use the following method. As soon as we have determined to wean the child, and have satisfied ourselves that the digestive organs are in a healthy condition, we place the patient on some such formula as the one before given, the prescription being filled in on a printed form, such as the following:

Feeding.—Milk mixture of . . . ounces. Fresh milk . . . teaspoonfuls or . . . ounces. Boiled water . . . teaspoonfuls or . . . ounces. Fresh cream . . . teaspoonfuls or . . . ounces. Sugar of milk . . . teaspoonfuls or . . . ounces. Peptogenic milk powder . . . measures. Lime water . . . .

After mixing the above in a nursing bottle, place the bottle in boiling water for ten minutes, but do not allow the mixture to boil. Let it cool sufficiently before giving it to the baby. Feed the baby every . . hours and once during the night.

Keep the baby in the arms while feeding and hold the bottle for it.

Do not allow it to lie down and nurse itself.

Have two bottles and two nipples, and alternate in using them.

If the child does not take all of the milk *throw the balance away.* Do not keep it.

After using it scald the bottle and nipple with boiling water; then fill the bottle with water containing some bread soda or borax.

Put the nipples in a cup or glass and cover them with some soda or borax water. Keep them there when not in use.

Before using again rinse both the bottle and nipple with boiling water. Never use tubes.

Drink.—A baby needs water. Give it from one to four teaspoonfuls several times a day. Boil a bottle full in the morning, and cork it up and keep it in the refrigerator for use during the day. Use only water that has been boiled.

Bathing.—Wash the baby once or twice every day in warm water with castile soap. Sometimes a little rock salt added will be good.

Clothing.—Have the bandages of wool, and not too tight. Tight bands keep the baby from breathing freely. The rest of the clothes should be cool. Have clean clothes every day if possible.

Change the diapers as soon as soiled, and wash the parts while doing so. Never use a diaper that has not been washed thoroughly in boiling water.

Fresh air.—Take the baby out in the morning and evening in hot weather, and keep in a cool place during the day.

NOTE.—*Follow the doctor's directions implicitly,* and never give the baby any medicines that have not been prescribed by him.

If for any cause we have reason to change the formula, we pick out from our milk tables one which is adapted to the needs of a child in the condition of the patient. Each formula of our tables has on one

side the percentages of fats, proteids and sugar with the degree of alkalinity, and on the other side the amounts of cream, milk and sugar in drams and ounces. These latter we change to teaspoonful and tablespoonful, so as to be more easily read by mother or nurse. We always have the patient return at least every other day and its symptoms are carefully noted. Should any element of the milk formula seem to be disagreeing, this is changed to suit the indications of the case, and should the mother or nurse not understand the methods for the preparation of the milk, we always send one of our clinical assistants to show her. By this very simple method we have saved the lives of some hundreds of infants, and we are happy to say that we have very seldom found even the most ignorant mothers who could not follow these simple rules. Sometimes when we are in doubt as to the mother's preparation of the milk mixture we have the mother bring a bottle to us for testing. In a future edition of these slips we intend having the rules printed in several languages, as our clinical patients are of all nationalities. Among private patients it is often possible to go a step farther, and to use the methods for the home modification of milk which are described by Rotch and revised by Cautley. The articles required are as follows: A wide-mouthed glass jar holding one quart, a syphon of glass tubing, one quarter to one-half an inch in diameter and bent so that the end out of which the milk is to flow is six inches longer than that inserted into the jar. One quart of fresh milk from a herd of cows is thoroughly strained and put into the jar, which is kept open for fifteen minutes in order to allow it to cool. The jar is then sealed tightly and placed in a vessel containing ice-water and salt in the proportion of a teaspoonful of salt to a quart of water. This is set in a cool place for six hours. At the end of this time syphon out from the bottom of the jar three-fourths of the milk into a clean vessel. The mouth must not be used to start the flow of milk through the syphon, but the latter must be filled with clean boiled water, the lower end closed with the finger and the syphon inverted, the shorter end being placed in the milk. When the finger is withdrawn the water, followed by the milk, will run out of the longer division. The materials necessary for preparing the milk mixture are as follows: First, the milk which has been syphoned from the jar; second, the milk which remains in the jar and which contains 10 per cent. of fat; third, milk sugar. This may be purchased by the pound and divided by the druggist into packages, each containing $3\frac{3}{4}$ drams or 200 grains. Fourth, some lime water; fifth, some well boiled and filtered drinking water. The milk sugar is first to be dissolved in the water and the other ingredients added in the necessary proportions.

Holt's most excellent formula, as given in his textbook, while simple and practical to those who have had considerable experience in the use of modified milk, we have found too complicated for home use. We must repeat that we consider the most important point in favor of the use of modified milk is the ease with which the proportions of a certain formula may be changed to suit the peculiarities in the digestion of the individual child we are treating. It is not always necessary to adhere to intricate calculations if we have only one basic formula to work on. A study of the symptoms produced by an excess or scarcity of any one element will speedily enable us to tell whether the milk is agreeing or not.

MILK LABORATORIES.

Of late years reliable milk laboratories have been established in different parts of the country. In 1891 Mr. G. E. Gordon established in Boston what was known as the Walker-Gordon Milk Laboratory. Since then branches of this house have been opened in New York, Philadelphia, Baltimore, Montreal and Chicago. These laboratories furnish milk, which is modified upon a physician's prescription, in exactly the same manner as an apothecary dispenses drugs. Briefly, the principal points of superiority of this method are as follows: 1. The primal milk supply is under the supervision of the laboratories and the cows are selected, cared for and fed with but a single purpose in view, namely, the production of a milk suitable for infants' use. 2. The freshness of the milk is not impaired by the process of preparation. In these laboratories the milk is modified exactly and scientifically. Every infant has milk freshly prepared, the formula being made to suit the particular digestion, the fats, sugars and proteids being prescribed with this object in view. 3. The milk is modified and sold upon the physician's prescription, so that overanxious mothers and nurses can make no mistakes as to the quantity and quality of the milk preparation. The greatest advantages in this method are the accuracy of the prepared food and its careful sterilization or Pasteurization before its delivery. The principal disadvantages are that it is somewhat expensive, and at the present time such milk is hard to obtain within more than one hundred miles of any of our cities. In compounding and modifying milk, the directors of the laboratory consider the milk only in the light of its component parts. In the modification the following articles are used: 1. Cream which contains 16 per cent. of fat (centrifugal cream). 2. Separator milk from which the fat has been removed by a centrifugal machine. 3. A standard solution of sugar of a strength of 20 per cent. It is possible by varying these elements in different proportions to produce almost any degree of modification. In writing a prescription for a modified milk, the physician fills out a regular prescription form furnished by the laboratory, using any percentage of fat, sugar or proteids that may be desired, giving the quantity desired for each feeding and the number of feedings in the twenty-four hours. The laboratory furnishes a daily supply in the bottles from which the child is to be fed.

Among the most recent methods of modification is that of Dufour (*Rev. mens. des Mal. de l'Enfance* September, 1896, quoted from the American Yearbook of Medicine and Surgery.)

Dufour gives the following method for humanizing cow's milk: Put the quantity suitable for one day at the child's age into a large graduate with a corked spout at the bottom. Set aside tightly covered and and at a proper temperature for four hours to allow the cream to rise. Draw off one-third the lower milk and add the same amount of water. Add 35 grams milk-sugar and 1 gram of salt per liter. Shake and pour into sterilized bottles. If the child's gain in weight is unsatisfactory, add a teaspoonful or two of cream to the whole amount of milk. (The replacement of one-third of the bulk of milk by an equal quantity of water reduces the proteids and salts of the milk, but does not reach the proteids of the cream.) More definite results are obtained in the wholesale manipulation advised by Dufour, in which

the milk is diluted with one-third of water and to each liter of the mixture are added 15 to 20 grams of milk-sugar and 1 gram sodium chlorid. The amount of cream here added produced 4 per cent. or more of fat. This preparation is used in all cases, the amount at a feeding alone varying with the age of the child.

Hesse describes in detail in the *Berlin Klin. Woch.*, July 27, 1896 (quoted from Yearbook of Medicine and Surgery, 1897), an improvement on the so-called Dresden modification, a description of which, from an English observer, Worcester, was given in the Yearbook for 1897. Using Lehmann's analyses of human milk and cow's milk, Hesse demonstrates that if to 1 liter of 9.5 per cent. cream, 1½ liters of water are added, and to this 105 gm. of milk-sugar and fresh egg albumin (enough to represent 9.5 gm. dried albumin) a mixture is produced yielding 1.2 per cent. casein, 0.5 per cent albumin, 3.8 per cent. fat, 6 per cent. sugar and 0.4 per cent. ash. To insure sterilization, however, he found that better results could be obtained by drying and pulverizing the paste of albumin and sugar; and the similarity to human milk was more closely approached by adding to this in process of manufacture a certain amount of lacto-saccharate of iron. The resulting sterile powder is readily soluble in water, and when added to the diluted cream produced a mixture very closely resembling mother's milk in all its ingredients. In practice it was found that a reduction of the fat percentage to 3, and of the sugar percentage to 4.5 gave a more readily digested mixture. In a series of cases fed from birth to 1 to 5 months the average monthly gain was 13 oz (not a very encouraging showing under conditions most satisfactory for testing a new process of feeding).

Gaertner's fatty or mother's milk.—Gaertner, in his *fettmilch*, or mother's milk, aims to reduce the excess of casein in cow's milk by the use of the following method: A separator, known as the Pfanhauser centrifuge, making 4800 revolutions a minute, is employed. The machine is filled with equal parts of fresh cow's milk and sterilized water. The speed of the centrifuge is regulated so as to separate the mixture into 1, creamy fatty milk; 2, skimmed milk. The two portions are led off by as many openings. An analysis of each of these portions shows that the creamy milk contains the same quantity of fat as found in human milk. About 2 per cent. of the casein is contained in the skim milk, and the balance, 1.7 per cent., remains in the creamy milk. In order to bring up the proportion of sugar to that found in human milk about three or four gms. of milk-sugar are added to every 100 c.c. of the fat milk. It is claimed that the fat milk has the advantage over diluted milk of having a higher percentage of fat, while the curd is rendered more digestible. This method of infant feeding has been quite extensively tried by Dr. Louis Fischer of New York, who claims to have had excellent results. Our own experience with it has been somewhat limited, and while the results have been fair, we do not think that they have been equal to those obtained from the use of modified milk. We are, however, still using it, and hope to be able to make a further report at some future time.

Condensed milk.—Condensed milk is largely used by the poorer classes as an article of food for infants. Being sealed in air-tight cans or jars and containing a large quantity of sugar, it is easily preserved for a considerable time. It is also cheap and prepared with comparatively little trouble—both qualities which recommend it to the poor mother with the care of a large family. All that is necessary for its preparation is to mix with a certain quantity of water and pour into a nursing bottle. The proportion of lactose and cane sugar in condensed milk is in excess of that found in the human or cow's milk, yet the amount of fat and proteid, as well as the alkalin mineral matters, is considerably less. It is true that the large amount of sugar present tends to prevent constipation, but the other elements being disproportionately small makes condensed milk, as an article of food, deficient in general nutritive properties.

Children fed on condensed milk soon become fat, and for some time the digestion really seems to be improved; this is more frequently the case if the child is changed to a diet of this substance from one of farinaceous foods. After a continued diet of condensed milk, however, a child generally becomes flabby, restless or sleepy, suffers from impaired digestion with considerable fermentation, and is apt sooner or later, to drift into a condition of marasmus. Some of the worst cases of simple atrophy that we have seen have been infants who have been fed for a long time on this form of diet. In these children the period of dentition comes later, is irregular and prolonged, and a strong tendency to rickets or a chronic state of malnutrition is manifest. It has also been noticed that if children fed on this diet fall into a subacute diarrhea, it is almost impossible to save their lives.

Proprietary foods.—Many of these foods seem to be quite carefully prepared, and, having the advantage of convenience and cheapness, may be introduced with good results by the end of the first year. It has been taught by some authorities that finely-divided starch or dextrin introduced into milk acts in two different way: First, by its nutrient powers and secondly by its mechanical action. By mechanical action was meant that it was supposed the particles of the starch or dextrin so diffused themselves among the globules of fat and casein of the milk, that the former were prevented from separating from the emulsion and the latter could not form a tough curd in the digestive tract of the child. This theory has of late years been disputed, and experiments seem to prove that the action of these substances as attenuants, so-called, is of little consequence. As far as their nutritious properties are concerned, the starchy or dextrined foods are far inferior to milk, for two reasons: First, the proportion of tissue-building to the heat-producing elements is much below that of milk. In the second place, the starch, which is a heat-producing principle, must be converted into sugar before it can be absorbed. This change is accomplished by the action of the pancreatic juice and saliva, neither of which are to any extent established before the fourth month of life. The undigested starch, therefore, remains in the gastro-intestinal canal and is extremely likely to cause fermentation. In order to make up in some degree for lack of nutritive properties, all farinaceous foods should be prepared with milk, and it really becomes a question whether in infants under 8 or 10 months of age, the nutritious principles are not dependent much more on the milk than on the food itself. In regard to proprietary foods it may be said that their best quality is that they form an easy and convenient way of introducing starch or partially dextrined starch into some modification of milk.

Dextrined foods.—Many preparations are sold in

which, by previous heating or by digestion with diastase, wheat or barley flour is so modified as to be more easily digested than simple starch. By the action of a temperature of 300 or 400 degrees F. the principal substance, starch, forms dextrin, a body differing from starch in the fact that it is soluble, and has the characteristics of a gum. Quoting from the investigations of Professor Leeds, we find that the flour selected for such treatment should be rich in albuminous substances and made from wheat grown at certain seasons and of a certain grade, and should be made by the roller process.

Liebig's foods.—Under this head may be classed a number of proprietary foods, the essential construction of which is as follows: The flour is prepared by means of diastase, equal parts of wheat flour and barley being used, and a certain amount of wheat bran added. The latter substance is used because of the adherent phosphates and nitrogenous matter. To these 1 per cent. of bicarbonate of potassium is added, with water sufficient to make a thin paste. This mixture is allowed to stand for several hours at the ordinary temperature, after which the latter is raised to 150 degrees F., and this is continued until all the starch is converted into maltose and dextrin. The mixture is then strained and the residue pressed and exhausted with warm water, after which the extract is evaporated into vacuum jars at a moderate degree of heat. The process is completed by drying at a higher temperature, the mixture being stirred thoroughly.

Dextrined foods intended to be used without milk.—This class of proprietary foods are prepared with the intention of using without the addition of milk, water only being necessary to prepare them for the feeding. In the majority of these the starch, which has been partially or completely converted into dextrin, has been evaporated with milk during their manufacture. An outline of their preparation is somewhat as follows: The flour is first made into dough and baked, after which it is finely ground and mixed with condensed milk, and then dried by a slow heat of moderate degree. In the resulting mixture the starch has been wholly or partially converted into maltose or dextrose. The albuminoids of the flour have undergone about the same changes as take place in other farinaceous foods. The milk-sugar has undergone coagulation and the casein has become dried into a fine powder. An example of this class of foods is the one sold under the name of Nestlé's Food. Somewhat recently a food known as Eskay's Albuminized Food has been introduced. The manufacturers of this food have endeavored to combine egg-albumin with the other constituents.

In regard to the value of these foods, we must say that there is no one of them that can be referred to as being the best upon which to feed a large number of children or a single child during a long period of time. That they have a certain amount of usefulness can not be doubted, but our experience has taught us that for a diet for children under 10 months of age they are far inferior to modified milk.

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Glycerin in Chronic Rhinitis.—Molteni considers this treatment the most effective for this affection. The glycerin is best applied introduced into a pig gut or fish bladder previously inserted in the nose, through which it exerts its effect on the congested vessels.—*Gazetta degli Osp. e delle Clin.*, September 8.

PROMPT ATTENTION TO EARACHES IN INFANCY AND EARLY CHILDHOOD.

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Children are not only more sensitive to abnormal impressions from without, but are more responsive to curative influences within, whether natural or artificial. As a general rule, it may be considered that they are more quickly affected by disease and influenced by treatment, inversely as their age. In adults the power of resistance is great, but when the limit of normal poise is once overcome, disease lasts a comparatively long time and convalescence is slow, whereas in children, we know how suddenly an illness reaches the danger point, and after a comparatively short run, is better. This rapid recuperative power of the child is not always an unmitigated blessing, as it is often presumed upon, and from too great a reliance on nature, diseased conditions are overlooked, and the convalescent disposition is undermined and sometimes physical structures taxed beyond power of restoration.

The result of this sort of unintentional neglect, is seen nowhere more clearly than in the consideration of ear pain in infants and children. Pains in the ear are often such a common story in a household where there are several children, that little or no remedial attention is paid to them, and this lack of attention is by no means confined to the poor and ill-informed, but is observed frequently among the educated and well-to-do.

We are constantly informed as to a child's having had or having earache for days or weeks, sometimes that it is subject to recurring attacks, and yet the parents have done nothing to relieve the pain or inflammation, relying on the apparent results of preceding attacks, that the child has not become markedly worse therefrom. They do not even ask ordinary advice, asserting sometimes in a half-questioning manner, that the attack of pain will gradually disappear, or will mention some family tradition to the effect that children outgrow them. Some, indeed, carefully shield the child from cold, or employ laxatives and confine it to a mild diet. Again, some will have used hot sweet oil or glycerin, or laudanum with glycerin or sweet oil, to relieve the pain, but only a small proportion will have used any rational measures to allay the pain, and those who, in addition, have used measures to overcome the cause, are very few indeed.

Unfortunately, this complacent view is sometimes shared by the family physician. Too often he advises no treatment. Sometimes the treatment instituted is irrational and not directed to a prompt dissolution of the trouble. That they do require immediate attention is evident when we observe the after-history of these cases of neglected ear pains.

It is a matter of common knowledge, that more than three-quarters of all cases of ear affections originate in diseases of the throat and nose, and extend to the ear. Those arising from primary inflammation of the ear structures, are rare. There are a few cases arising from toxic or specific blood conditions, as well as a very limited number due to some primary influence on the nervous structures.

Whenever ear pain is present, exploration of the nose and throat should invariably be made. If the

condition of these parts were not known before, the examination may shed considerable light on the special structures examined, as well as on the condition of the general health. We will almost always find some throat disease present, either obstructive or inflammatory in character. Enlarged and inflamed tonsils are the most common, but pharyngitis, edema, ulcerations, abscesses, elongated uvulæ, as well as nasal catarrh, polyps and pharyngeal adenoids are by no means uncommon. To the light shed on the pain from these sources, we must add that obtained from an examination of the general condition of the child's circulatory, nervous and muscular systems.

It is not uncommon to find the throat and ear condition secondary to malnutrition from indigestion and even comparatively mild forms of acid dyspepsia. In fact, many of the supposedly rheumatic cases of throat, nose and ear diseases in children, attended by soft hypertrophic nasal swellings, with profuse discharges, or by soft spongy tonsillar enlargements with attacks of ear pains occurring usually two or three times a year, are undoubtedly, in their origin, cases of acid fermentation, and by strict attention to diet in their onset, would often be avoidable.

This question of diet is a most important one, and by strict attention to measures based on a recognition of its importance, physicians have of late years been able to prevent much suffering and to save thousands of lives, but what is a greater gain to the race, are enabling men and women to become healthier physically and therefore mentally, than any that have gone before. Children's habits especially, vary so much that each child must be carefully studied so as to observe to what extent his ways invite colds or nervous exhaustion with the development of reflex and inflammatory conditions.

Many times, the attacks are caused by a general or local chilling of the surface of the body from improper or insufficient clothing, or from moistened clothing about the buttocks or chest. All skin clothing, that is the first layer from the neck to the toe, from January to December inclusive, should invariably be of wool. It absorbs more water from the skin than any texture of equal weight and retains within its fibers more air and greatly lessens the liability to chills and colds. This hygienic law applies equally to adults. Some mothers, believing in the hardening process, or because of fashion, dress children with insufficient clothing—legs and arms bare, neck and upper chest exposed. Among the poor, such exposure occurs often from necessity.

Again, harm is done by the prevalent doctrine that the night clothing should not be as heavy or warm as during the day. This view is certainly absurd. At night, the coverings should be usually a little more and warmer than in the day, because, during the day, while the body is in motion, it adds, by combustion, more heat than when the body is quiet. To keep the same temperature of the body at night, would require the covering of the body with a greater amount of heat non-conductors. It is a fact that the night-sleeping body, not usually exhaling as much moisture as the day-working body, requires less heat to protect it from chilling, yet during the day, the extra heat needed, is supplied by the combustion of muscular tissue elements, whereas this is entirely withdrawn while asleep. The clothing during sleep, should be a skin covering of wool with as much covering beside, as will equal or exceed that worn during the day.

Some neglected earaches may get well without treatment, but as a rule, the child's physical condition, as well as his ear, is to some extent affected by every inflammation of this organ. Continuous pains of the boring, pressing, bulging kind exert an influence on the nervous system, which is often somewhat relieved by violent sobbing, restlessness and great irritability, but the nervous system is weakened, loses its energy, and is sapped at times to such an extent as to produce convulsions and even cause death from reflex phenomena.

Inflammation of the middle ear cavity, which is almost without exception present whenever there is ear pain, if unrelieved by nature or art, extends and gradually involves the surrounding parts and later on affects the bony structures, giving us mastoid disease with sometimes a mastoid opening; or, again, extending through the tympanic plate, causing meningitis and at times cerebritis. Sometimes it involves the sinuses, causing phlebites, resulting often in death. In children pus formation is so much more common and rapid than in adults, that we usually have pus formed early and quickly, infiltrating the surrounding tissues. Rarely do we have mucus or epithelial excretions. It is because of this peculiarity of rapid pus formation that sometimes serious results occur in these cases, before any provision has been made anticipating the involvement of the fatal spot.

I recall having been sent for some years ago, to see a case of ear disease, occurring in a child four years of age. In his letter to me, the doctor, after describing the onset of the symptoms and the progress of the case, mentioned that though he preferred me to see the case the day the message was received, if I found it inconvenient, the next day would do, mentioning that he scarcely deemed it essential that the case should be seen by a specialist, yet, to satisfy the family, he thought it best to do so. This message was received shortly before noon, and as I was preparing to go to see the child about 4 o'clock the same day, a messenger came from the family, announcing that the child had died of the ear trouble. It appears that it had been a case of earache occurring in a child rather subject thereto, and in which few if any measures had been taken in the past to arrest or cure the trouble. This attack proving more severe than usual, they called upon their family physician some two or three days after the onset. He, believing the case needed a little tonic and sedative treatment, prescribed accordingly. On being sent for again the same day, he advised the use of warm oil and laudanum. The next morning, the child having suffered violently with pain and having been unable to sleep, he was again sent for and used several doses of morphia, and ordered the bowels to be freely opened with mild chlorid of mercury. Upon returning to his office, he sent me the note above referred to. The child died the same day in a state of collapse, the severe pain persisting, until unconsciousness appeared. No postmortem examination was made, but it was undoubtedly a case of cerebral involvement, following upon the erosion of the tympanic plate. These cases are numerous; far more so than is usually supposed. Undoubtedly many a case which is thought to be a specific variety of meningitis, is but a concealed case of ear disease. Many a case of supposed stomach and internal disorder with malnutrition, has died from ear disease. I, personally know of three such cases, and have heard rumors and have indefinite knowledge of others.

Some of the children supposed to have died as the result of a blow or a fall, would never have died therefrom, had there not been present concealed ear diseases, affecting the mastoid or other parts of the temporal bone. In two such cases, I have been compelled to testify before the coroner, to exonerate from the charge of murder, those who had inflicted such blows. In both cases, the mastoid was riddled and honeycombed with old disease, and in both was the cerebral surface of the temporal bone eroded, making direct connection between the brain cavity and the tympanum. In one, there was, in addition, a cerebral abscess directly connected with the diseased ear.

The symptoms in another case, interesting in this connection, were those of a young lady, who was sent to me from the upper end of Bucks County, and who died in our city while her case was being studied by several of our physicians. She was sent to me on account of her sight, there being entire loss thereof. The condition was that of total atrophy of the optic nerve, but there was in addition, the history of epileptiform attacks. From the history of the case and the physical examination, there seemed to be sufficient evidence of increased cerebral pressure, supposed to be occasioned by a brain tumor, to justify the consideration of an operation. After several weeks of hospital observance, by one of our most distinguished surgeons, he declined to perform it, believing it not to be justified. Her general health was very good. She was in the best physical and mental condition, when one night she retired early, as usual, and was found in a normal sleeping attitude, dead in the morning. The postmortem revealed a large cerebral abscess, directly connected with a perforated internal plate in the temporal region, the temporal bone, being in great part destroyed. During her life, her hearing had not been markedly deficient in either ear and her drum heads were intact but thickened. After death, it was learned that as a child she had had violent, frequent attacks of ear pain with frequent pus discharges, but for some six years before her death there was no history of ear disease or ear pains of any kind.

The symptoms in the two preceeding cases had been—as in the last case—attacks of pain lasting for days, at times mild and again almost beyond endurance, exaggerated at night, sometimes attended with and sometimes without pus discharges, yet the family in not one of these cases, seems to have realized the danger of these symptoms or the importance of prompt treatment.

Of late years, accurate examination of the bony ear structures has been far more common at postmortem than formerly, and the frequency with which extensive disease in this location had been found, has much surprised the pathologist and the coroner, the decision in numerous cases being that death has been caused by ear disease where the diagnosis made during life had been far otherwise. Very many cases of deaths from unrecognized ear disease, especially in children, have occurred in the past, and even now occur yearly by the score in all of our large cities and throughout the country.

The story of ear pains, and therefore of ear inflammation, is one which should be displayed prominently in every nursery and school. Ear pains are dangerous; they are not fleeting, evanescent nothings, but indicate a condition of inflammation of the middle ear, which is necessarily followed by more or less damage to the parts and impairment of the general health.

Among the minor points to be considered are, the tendency to recurrence and the consequent nervous and physical exhaustion engendered and the impairment of hearing more or less great and more or less permanent, the necessity of throat and nose examination and treatment, and attention to the general condition and mode of life.

Among the more serious aspects to be considered are: 1, the possibility of the attacks causing total or considerable loss of hearing, and the consequent lack of proper mental development; 2, the serious inflammatory complications terminating in idiocy or epileptiform convulsions; 3, weakening of the bony structures about the ear, predisposing to their serious involvement from slight accidents and to attacks of cerebral disease.

The citing of perhaps a few aphorisms in regard to their avoidance and cure is more important than a recounting of their danger. Whenever a severe catarrh of the nose in a child occurs, call in the physician. If the attack be a mild one, use protectors, preferably of petroleum ointments, without and about the nose. If the throat is diseased, have it treated. If the nostrils are obstructed they should be cleared. If the tonsils are enlarged, they should be reduced or removed. Any general derangements present should be recognized and attended to at once.

All cases of ear pain should be referred to a physician, and pending his arrival, sweet oil can be rubbed into the neck and about the ear, or tincture of iodin be painted over the mastoid, or if the pain is severe, even a cantharides plaster can be applied. If the pain continues or is excruciating, syringe the ear gently with hot water or apply a hot water bag or hot wet cloths or even hot flaxseed poultices frequently renewed, keeping head high above level of rest of body. Occasionally, ice gives the most relief. If severe pain persists, use hot bags at feet or a hot footbath followed by dry heat; sometimes a mustard poultice on the stomach, is required in addition. Use cathartics, especially calomel, liberally and keep the child on a mild diet. Examine the ear carefully, whenever ear pain is present, and determine at once the nature of the trouble and act in accordance with the conclusions reached.

If the ear pains and the subsequent progress of the disease present in cases of acute fevers, were but promptly and properly attended to, there would soon be a marked decrease in the number of the deaf in our midst. The neglect of these cases often necessarily follows from the engrossment of the doctor's energies in the primary disease, and is in some cases undoubtedly unavoidable, but whenever possible, prompt attention should be bestowed on that organ which, from a utilitarian as well as artistic aspect, is of such great importance.

1723 Walnut St.

FRACTURE OF THE CLAVICLE IN CHILDREN.

A STUDY OF TWO HUNDRED CASES TREATED BY SAYRE'S METHOD.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY A. E. GALLANT, M.D.

NEW YORK CITY.

Of all fractures in children that of the clavicle is

most common and presents the greatest difficulty in securing union without deformity.

In a surgical service including 18,042 children of 10 years and under, there occurred 343 fractures, of which 172, or 50 per cent., were fractures of the clavicle. Of this number, 12 were under twelve months; 112, 1 to 5 years and 48, 6 to 10 years old. The youngest was but six weeks old. Three cases between 1 and 5 years came to us with faulty union. The fracture was located at the outer portion of the middle third, and in most cases there was distinct separation, and knuckling upward of the fragments. All were single, simple fractures, with little evidence of laceration of adjacent tissues. The line of fracture was more or less oblique, with upward and inward displacement of the acromial fragment. Falling on the outstretched hand was given as the cause of the injury.

Up to the time when Lewis A. Sayre described "A Simple Dressing for Fracture of the Clavicle" (Bellevue and Charity Hospital Reports, 1890), no satisfactory plan which would meet the anatomic conditions had been proposed. Since then it has almost superseded all others.

Deformity.—In reference to the deformity, Sayre says that "all authors agree that the deformity which occurs in the fracture of clavicle is, that the shoulder falls downward, forward and inward, and that the outer end of the sternal or inner fragment always rides over the inner end of the outer or acromial portion of the clavicle." Such a displacement of the fragments has not been met with in the series of cases here reported. The point of fracture has been at the outer portion of the middle third, with the shoulder dropping downward, inward and forward, thus dragging on the acromial fragment so as to make an angle or knuckle at the seat of fracture, but the inner fragment has not been found displaced above the outer fragment as described by Sayre and Gray.

DISCUSSION.

Dr. A. C. COTTON, Chicago—In using plaster for the correction of this tendency to deformity, or for any surgical purpose whatever, my experience has been that not infrequently you meet a case whose skin won't stand plaster, the continued use of a plaster for even two days bringing out a very troublesome eruption. The Doctor did not state, but I suppose a dressing put on for curing this deformity must stay on ten days to two weeks.

Dr. GALLANT—The dressing is left two weeks.

Dr. COTTON—Many cases will not stand plaster for two weeks. At a certain time of the year you can dress only a few cases in this way. Even when the temperature is most comfortable, some cases will not stand plaster. Where I can not use plaster I have been in the habit of using a stocking, introducing the hand into the stocking to the very toe of it and carrying the stocking around and attaching a bandage to the upper part of it. First having made a collar, by rolling up some muslin, perhaps with some cotton, to encircle the shoulder, I sew the stocking to this collar. A "figure eight" bandage brings both shoulders backward, another bandage holding the arm firm. I believe that accomplishes all that is claimed by the dressing just presented. This dressing is the simplest, I believe, that has ever been devised, but some will not bear it.

Dr. R. B. GILBERT, Louisville, Ky.—In a case of fracture of the clavicle last summer I found the difficulty the Doctor refers to, in a child with a slightly eczematous skin. In that case I perforated the mole-skin bandage, which is the best bandage to use in such cases. In that way you can obviate to a large extent the irritation of the skin, but it does not entirely obviate it. It is much better than a pad in the shoulder, which not only causes irritation but presses on the vessels and nerves in the axillary space and often causes swelling and pain so it has to be removed. The over-shoulder strap is certainly of very great advantage, and it would, it seems to me, obviate deformity. The adjustment of these plasters I think should be done under chloroform. Otherwise the constant motion prevents proper adjustment of the bandage. The anesthesia need be but partial.

Dr A. ERNEST GALLANT, New York City, in closing—In reference to the irritation, if you use a baby powder and use absorbent cotton in the fold of the arm, which you can tuck in after the arm is put up, the irritation to the outer arm does not amount to much. If, as the Doctor says, you wish to use the perforated plaster, you may do so. One point in reference to the plan suggested by Dr. Cotton is that when you put a child up in a bandage you have got to put it up to stay. Last year I showed you how to put up the femur of a child so the child could do anything it pleased. The old way was to strap the child down, but in the way I suggested the child can play or do anything it likes. I have no doubt the plaster itches, but that we can not avoid. I appreciate the difficulty of this plaster, because I have had to use considerable plaster on my own hands and fingers in dressing infective wounds on myself. But in any other way the child's arm moves more or less and there is great difficulty in the healing of the fracture. I never use chloroform but I use laughing gas for the short operation. Perhaps I am not quite so careful as to causing a little pain in children.

After I had examined the child and found the fracture of the clavicle, I remembered having measured the child and found the shoulders three inches more in circumference than the head. It was a dry labor and I have no doubt I broke the clavicle when I brought the child into the world. I did not put any dressing upon it, nor shall I attempt to break it.

NEURO-DEFORMITIES IN CHILDREN FROM AN ORTHOPEDIC STANDPOINT.

Presented to the Section on Diseases of Children at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY JAMES W. COKENOWER, A.M., M.D.

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DES MOINES, IOWA.

It is generally conceded that nearly all deformities, especially in children, not traumatic or hereditary, are due directly or indirectly to some abnormal condition of the nervous system. This branch, like all other branches in medicine and surgery, bows with obedience to its alma mater, because we can not understand the anatomy, pathology and histology of the nervous system, the cerebro-spinal or any other specialized nerve-cell, unless we understand general medicine and the laws of cell-birth, life and growth.

My experience, as a general practitioner, prompts me to admit that nothing is more important than the nervous system and its disorders, and yet there is nothing in medicine in which our knowledge is so deficient. In the investigation of even so simple an ailment as headache, the field of medicine must be well examined to know whether the real cause of the pain is vicious heredity, nephritis, lack of exercise, anemia, puberty, menopause, menstruation, masturbation, occupation, or one or more of a myriad of other influences and diseases, all of which it is necessary to know to cure a simple headache. How much more, then, is it necessary for him who would suc-

cessfully treat the nervous system, especially to that extent to obviate deformities produced by or through the nervous system, to know thoroughly, not only the nervous system, but the entire human system, and everything that would hinder or augment its normal development. Unless we have such knowledge, we will still find ourselves treating apparent poliomyelitis for scorbutis, rachitis for paralysis, torticollis for cervical adenitis, trismus for an erupting wisdom tooth, and the "knee jerk" for morbus coxarius, these being deformities produced by abnormal changes in the nervous system. However, there are some "made to order" ovarian deformities, if I may be pardoned for mentioning the fact, which do not come under the scope of this paper, or any other, in many instances, and would not occur if a better knowledge of the nervous system and its influence over each component part of the human system existed. In many instances poliomyelitis or infantile paralysis in its various forms could be obviated if the functions and disorders of the nervous system were better understood. The remark once made by Prof. Jenner that more mistakes are made by "not seeing than by not knowing," is not without a lesson, and helps to confirm the fact that more mistakes are made in diagnosing than in treatment.

Next to the deformities produced by poliomyelitis or infantile paralysis, are those produced by hysteria, which the consensus of opinion of modern writers on the subject has placed among the diseases of the nervous system, which by no means is the most easily handled. I believe, the nervous system being well understood, that a line of general treatment may be used that will lessen the chances for such deformities and militate against existing ones. For this, the constitutional treatment must be looked after first, and the disease will always indicate same, after which the special treatment can be prosecuted and the drugs used indicated by the specialization of the disease. All kinds of talipes, or club foot, wrist drop, rotary lateral curvature of the spine, and, in fact, nearly all the muscular deformities known to orthopedic surgery may be produced by some nerve disease, and to undertake to correct the deformity with surgical means without first endeavoring to ascertain the real cause which produced the deformity, and treating the same medicinally, would not be in keeping with the modern medical and surgical science of the day. To more fully illustrate how easily we may be mistaken in the cause and results of deformities produced by diseases of localized nerves, or the nervous system, I will report the following case which has recently come under my observation:

December 7, 1897, Mr. B. brought his little three-year-old girl to me for examination, stating that she had a crooked back, which the doctor said was caused by the rickets. Upon a careful examination, I found that the child had a decidedly neuropathic family history, and a typic spasmodic rotary lateral curvature, which had been diagnosed and treated for rachitic curvature, and as the diagnosis was incorrect, the treatment must have been, because there had been no change for the better, but rather for the worse, after about six months' trial. The further history of the case showed that any kind of excitement or fatigue would increase the deformity, and when in a state of repose or sleep, the spasm of the muscles seemed to lessen. This convinced me that it was a case for medicinal treatment. I gave her a good general tonic, strychnin internally, and locally used inunction and massage, and put on a crinoline jacket to support the spine and lessen the fatigue caused by the effort of the child to stand erect. Six weeks later I put her on three-drop doses of fluid extract of conium, increasing gradually to thirty drops, and hypodermic injections of atropin. These two drugs have always given good satisfaction in such cases. One month after this treatment began, a marked improvement was noticed, which continued, and soon the amount of medication was gradually diminished, and time for same increased, until a little over three months from the time treatment first began, the jacket was removed and treatment stopped, as the spasm of the muscles was a thing of the past, and she could walk erect without support.

WHAT INFLUENCE DO STIMULANTS AND NARCOTICS EXERT ON THE DEVELOPMENT OF THE CHILD?

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY E. STUVER, M.Sc., M.D., PH.D.

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RAWLINS, WYOMING.

Since the earliest dawn of history, there has been inherent in the human organism a longing or craving for something to blunt the keen edge of anguish and sorrow, as well as to curb the intellect and inhibit the will, thereby giving full reign to the sentiments and passions during times of conviviality and enjoyment.

Glancing down through the ages into the dim twilight of the past we behold the Chinese using wine from grapes and beer from rice, somewhat like the present saki of Japan; the Hindus sura made from rice, barley, honey and other ingredients by the common people and soma made from the juice of certain plants, and after fermentation offered as a libation to their favorite Gods, Indra, Vishnu and others by the priesthood and rulers. "The ancient Persian writings, the Zend Avesta, dating back to the period of Zoroaster possibly 4000 to 6000 years B.C., contain, like the Rig Veda, many references to a sacred drink, homa, and a popular drink, hura."[1]

The Bible contains numerous references to the use of wine, which was frequently carried beyond the point of moderation. And so down through the ages we find all peoples from the lowest savagery to the highest civilization resorting to some form of intoxication. Here on the one hand we behold the highly cultured lady imbibing her strong tea, the orator or statesman trying to conjure up the shade of Demosthenes or Cicero or the poet to arouse his slumbering muse by liberal potations of wine, brandy or whisky, while on the other hand we see the Guatemala indians fuddling themselves with hemlock sap, the Peruvians with coca, the Tartars with fermented mare's milk and the Algerians with hasheesh.[2]

To the scientist and the philosopher, whose function it is to study the phenomena of nature, search out their causes, trace their effects, and co-ordinate all into a harmonious and symmetric whole, and especially to the physician, who should be a strong combination of both scientist and philosopher, this question appeals with peculiar force. What subtle but resistless power has impelled races, nations and indi-

viduals to give themselves up to an indulgence and debauchery that have inevitably led to their ruin or extinction? What caused the Persians under the temperate Cyrus, who by their hardihood easily conquered the effeminate Medes, to fall victims to luxury and degenerate so that Xerxes, the descendant of Cyrus, the monarch of Asia Minor, with his mighty army, was ignominiously defeated by the hardy and temperate Greek? What, except gross intemperance and its twin sister, licentiousness, so degraded the stern, noble Roman character, reduced his physical power and dissipated his ambition, until from being the ruler of the world, he became an easy prey to the barbarian hordes of the north? What, in short, throughout all time and among all nations, has been the result of the use of narcotic and stimulating poisons, save effeminacy, degeneration and extinction? With these indisputable facts of history before us, does it not become our duty as physicians, whose function it is not only to cure disease but to act as the conservators of physical, mental and moral integrity, to investigate carefully the exact physiologic effects exerted by these agents on developed and developing living organisms, and to trace the results of their moderate and excessive use both on the present and future generations?

We shall first consider the most widely used and probably least injurious of these substances, viz., *tobacco*. The deleterious substances in tobacco smoke are: *carbon*, which acts mechanically as an irritant, and discolors the secretions of the bronchial tubes, *carbonic acid gas*, which tends to produce sleepiness, headache and lassitude, *carbonic oxide*, "a very active, poisonous agent producing drowsiness, unsteady movements of the muscles and vomiting,"[3] and crude nicotine, which consists of nicotine proper, and a volatile empyreumatic substance containing ammonia, and a dark, bitter, resinous extract.[3] The ammonia bites the tongue, makes the mouth dry and induces thirst, thereby causing the smoker to drink frequently and exciting a free salivary secretion; it also exerts a solvent influence upon the blood.[3] Nicotine proper, produces tremor, palpitation of the heart and paralysis, while the volatile empyreumatic substance causes a sense of oppression, and gives an unpleasant odor to the breath.

Concerning the physiologic action of tobacco, Wood (Ther. and Materia Med., 6th Ed., p. 396) writes as follows: "Upon persons who are not habituated to its use, tobacco acts as a very powerful depressant, producing horrible nausea and vomiting, with giddiness and a feeling of intense wretchedness and weakness. If the amount taken has been large, to these symptoms are added burning pain in the stomach, purging, free urination, extreme giddiness, passing into delirium, a rapid, running and finally imperceptible pulse, cramps in the limbs, absolute loss of muscular strength, a cold, clammy skin, and finally, complete collapse, terminating in death." Nicotine is an exceedingly virulent poison; very small quantities, even 1/30 gr. have caused poisonous symptoms in the body (J. W. Sevier, M.D.), and large doses almost instant death.

Tobacco increases the fluidity of the blood, interferes with the development of and causes disintegration of the red blood corpuscles, diminishes the power of the blood to take up oxygen and give off the carbonic acid,[4] and thereby retards the progressive cell changes upon which the development of the body depends; it produces debility and irregular action of the heart[5] and lowers the tone of the whole circulatory system; it weakens digestion and assimilation, and not only prevents the burning up of waste materials but retards their elimination.

On the nervous system, tobacco acts as a depressomotor, producing "languor, feebleness, relaxation of the muscles, trembling of the limbs, great anxiety, and a tendency to faint."[6] It also acts as a cerebral irritant, and interferes with the vasomotor centers of the brain to such an extent that the vessels are unable to adjust themselves to the condition required for healthy and untroubled sleep.[7] The power of fine coordination is likewise decidedly lowered by the drug.

Tobacco frequently causes disturbances of the special senses. Owing to the irritation of the nasal mucous membrane the olfactory sensibility is impaired, and probably owing to the irritation and congestion set up in the nose and throat, together with central nerve disturbance, the hearing is sometimes lowered; but of all the special senses the sight is most seriously affected, and tobacco amaurosis or amblyopia is a not infrequent result of the excessive use of the drug.

While it is fortunately true that these effects, which are almost entirely functional, rapidly disappear when its use is discontinued by those who have reached manhood, it is very different with adolescents, in whom the habit of smoking causes impairment of growth, premature manhood, and physical prostration.[8] The question as to the effects of tobacco on the growing boy or youth has fortunately been removed from the sphere of sentiment and speculation, and is now settled by careful scientific investigations. "From measurements of 187 men of the class of 1891, Yale, Dr. J. W. Seaver found that the non-users of tobacco gained in weight during the college course, 10.4 per cent. more than the regular users, and 6.6 per cent. more than the occasional users of tobacco. In height the non-users increased 24 per cent. more than the regular users, and 12 per cent. more than the occasional users. In increase of chest girth the non-users had an advantage of 26.7 per cent. and 22 per cent., and an increase of lung capacity of 77.5 per cent. and 49.5 per cent. respectively. These facts in regard to the dwarfing effects of tobacco are corroborated by observations on the class of 1891, Amherst, made by Dr. Edward Hitchcock. He found that in weight non-smokers increased during their course 24 per cent. more than the smokers; in increase in height they surpassed them 37 per cent.; in gain of chest 42 per cent., and in gain of lung capacity 75 per cent. It is probable that alcohol and other poisons have similar effects."[8]

The deleterious effect of tobacco on the muscular system, and in diminishing the powers of endurance is strongly emphasized by the fact that "*stop* smoking" is one of the first injunctions given a young man on engaging in training for a race or game of any kind requiring strength and endurance; because every experienced trainer knows that smoking lowers the working power of the human muscle by a large percentage,[9] and that to smoke merely invites defeat. If tobacco so seriously injures the young athlete during a short period of training, how much greater must the injury be in the preparation for the arduous duties of our exacting modern civilization. How seriously handicapped is the boy who enters the race of life with every cell and tissue of his body poisoned by nicotine.

According to the evidence of teachers and educators all over the civilized world, tobacco exerts a very pernicious effect on the student. He becomes dull, lazy and unreliable, and retrogrades in his work. Indeed, so marked were these effects that "in France the difference between the students in the polytechnic schools who smoked cigarettes and those who did not, in scholarship, as shown by their respective class standings, was so great that the Government prohibited absolutely the use of tobacco in all government schools.[10]" "Out of thirty principals and teachers interviewed by the *Chicago Record*, all were agreed that a low standard of scholarship characterized the boy who habitually used cigarettes.[11]" The extended investigations of Dr. Seaver, of Yale College Physical Department, and Dr. McDonald's studies of school children at Washington, D. C., conclusively show that cigarette smokers are more feeble physically and mentally than other students.[12] This, together with the fact that a very large percentage of the prize-winners, and men who stand highest in their classes do not use tobacco, ought to convince every unprejudiced person that tobacco is at least injurious to the mind of the developing child and youth. We make this statement boldly, notwithstanding the recent symposium of St. Louis physicians, and the specious arguments and special pleading of lawyer Garrison in his paper, "A Brief for the Cigarette," read before the New York Medico-Legal Society, in which he tries to create the impression that because a large number of cigarettes examined were made of pure tobacco, and did not contain opium or other adulterants, therefore they were harmless. What sophistry! Just as though pure tobacco, which contains a substance far more poisonous than strychnin or morphin, is not in itself sufficiently dangerous! Such attempts as these which try to overthrow clearly demonstrated facts and encourage boys and young men in the formation of a habit which can do them absolutely no good, but may be the source of much injury, both to themselves and their friends, besides being a nuisance to every one not saturated with the vile poison with whom they come in contact, are certainly not based on correct ethical principles, and leave a strong impression that they are stimulated by a *quid pro quo* from the tobacco trust.

EFFECT ON THE MORAL NATURE.

The use of tobacco has a peculiarly demoralizing effect on the moral nature of the young. In addition to making boys tired, stupid and lazy, it makes them irritable, perverse and careless of the rights and feelings of others, besides, in many instances, leading to lying and even stealing. This tendency to moral degradation is exceedingly prevalent among habitués of all kinds of narcotic poisons, and especially so among those addicted to the use of opium. I have seen quite a large number of so-called "*fiends*," and have yet to find the first one on whose word I could rely in a business transaction. There may be honest ones, but if so I have never met them.

For many years I have been firmly convinced in my own mind that much of the pallor, anemia, malnutrition, and the many evidences of retarded growth and development so frequently seen—especially among the poorer classes of our people, are largely due to the tobacco-laden, poisoned atmosphere which these children are obliged to breathe. Many a time have I gone into small, poorly ventitated rooms, where at best it was difficult to get sufficient pure air, and found a child suffering from pneumonia or some other severe disease, so enveloped in the foul fumes of stale tobacco smoke that it could scarcely breathe, and every breath it did take was a poisoned one, and have seen the father, who appearently was very solicitous about his child's welfare, puffing away complacently at an old pipe whose horrible odor ought easily to win for it the place of honor in a tannery or a white lead factory, and while doing more harm than all the science and skill of the medical profession, armed by the whole materia medica, could counteract, would probably be finding fault with his physician and blaming him for the child's slow recovery. Nor is this the most discouraging part of the matter, because in quite a number of instances when their attention was called to the evil effects of the tobacco smoke the fathers became angry and refused to believe that it had any such effect. Such cases as these show the moral obtuseness that may follow and the utter selfishness that may be engendered by the use of tobacco better than any lengthy theoretical disquisition could possibly do. Neither, according to competent authority, is the evil limited to the users themselves, but lingers to curse their descendants. "No evils are so manifestly visited upon the third and fourth generations as the evils which spring from the use of tobacco."[13] says Sir Benj. Brodie.

Let us now consider the effects of alcohol on the human organism. Sir Benjamin Ward Richardson tells us that "from the stomach alcohol passes directly into the circulation, so in a few minutes it is swept through the entire system. If it be present in sufficient amount and strength, its eager desire for water will lead it to absorb moisture from the red-blood corpuscles causing them to shrink, change their form, harden and lose some of their ability to carry oxygen. It may even make them adhere in masses and so hinder their passage through the tiny capillaries." (Diseases of Modern Life.)

This attraction of alcohol for water, together with the fact that it coagulates albumen and forms a thin white film on the mucous membranes by acting on the albuminous elements of the secretions, and the peculiar ease with which it penetrates protoplasm (this substance can defend itself against most other poisons), suspends or destroys the action of all the primary organic elements.[14] In short, it affects every cell and tissue of the body and as Dr. Lionel S. Beale tells us, "alcohol does not act as a food; it cuts short the life of rapidly growing cells or causes them to grow more slowly,"[15] thereby preventing their proper development and exerting a particularly injurious effect upon the young, retarding their growth—both mental and physical.

EFFECTS ON DIGESTIVE AND ASSIMILATIVE ORGANS.

There is a wide divergence of opinion as to the effects of alcohol on the digestive organs. Formerly it was almost universally believed by physicians that alcohol in moderate amounts aids digestion, but the careful, accurate and painstaking investigations of recent years have demonstrated the fallacy of that opinion, and at the present time the majority of physicians who have made a careful study of this subject are convinced that alcoholic beverages not only do no good, but are positively injurious to digestion. "One tablespoonful of whiskey reduces digestive activity more than 75 per cent." say Drs. Chittenden and

Mendel.[16] "Nothing more effectually hinders digestion than alcohol."[5] says Dr. Richardson. "If much alcohol is taken into the system the gastric juice is so changed by its direct action that digestion is arrested,"[17] asserts Dr. Bunge. "The idea of alcohol in any form being an aid to digestion is altogether fallacious and has brought disease and ruin to innumerable multitudes,"[18] is the verdict of Dr. C. H. Shepard. Dr. T. D. Crothers says, "I have never seen a case where spirits used in any form, for any length of time, did not produce derangement and disease of digestion;"[7] and Dr. J. H. Kellogg writes as follows: "Nothing could be farther from the truth than the popular notion that alcohol, at least in the form of certain wines, is helpful to digestion." Roberts showed years ago that alcohol, even in small doses, diminishes the activity of the stomach in the digestion of proteids. Gluzinski showed ten years ago that alcohol causes an arrest in the secretion of pepsin and also its action upon food. Wolf showed that the habitual use of alcohol produces disorder of the stomach to such a degree as to render it incapable of responding to the normal excitation of food. Hugounencq found that all wines, without exception, prevent the action of pepsin on proteids; the most harmful are those which contain large quantities of alcohol, cream of tartar and coloring matter. Wines often contain coloring matters which at once completely arrest digestion, such as methylin blue and fuchsin."[19] Many similar expressions from the most celebrated physicians in the world might be cited, but the above are enough to show that alcohol even when exhibited as a therapeutic agent, should be used with as much care as strychnin, opium, or any other poison, and not in the careless, indiscriminate manner in which it has been used in the past.

From impaired digestion there naturally results a deficient supply of healthy pabulum for enriching the blood and building up the tissues. All the cells and tissues of the body are surrounded by membranes, on the integrity of which the silent work of building up the body depends. "If they are rendered too porous and let out the colloidal fluids of the blood—the albumin for example—the body dies, dies as if it were slowly bled to death. If, on the contrary, they become condensed or thickened or loaded with foreign material, then they fail to allow the natural fluids to pass through them. They fail to dialyse and the result is either the accumulation of the fluid in a closed cavity, a contraction of the substances inclosed within the membrane, or a dryness of the membrane in surfaces that ought to be freely lubricated and kept apart. . . . Upon all these membranous structures alcohol exerts a direct perverting power of action. It produces in them a thickening, a shrinking and an inactivity that reduces their functional power. That they may work up rapidly and equally, the membranes require to be at all times properly charged with water. If in contact with them any agent is brought that deprives them of water then is their work interfered with; they cease to separate the saline constituents correctly and if the evil that is thus started be allowed to continue, they contract upon the contained matter, in whatever organ it may be situated, and condense it." "By its effect on these membranous envelopes and coverings, alcohol becomes one of the most extreme causes of the modification of animal function and one of the greatest sources of structural degeneration."[3] "The long-continued presence of alcohol in contact with the membranes destroys their dialysing property and produces in the end organic changes."[3]

This effect of alcohol on the membranous structures exerts a most pernicious influence on the health and development of the body. While, as previously shown, its action on the digestive organs impairs the quality and reduces the quantity of the pabulum formed for the nourishment of the tissues, this last action not only interferes with the selective activity of the cells and tissues and the free passage of the nutritive material through their enveloping membranes but at the same time retards that retrograde metamorphosis which is always conjoined with healthy activity, and by clogging the membranes, prevents the free elimination of those retrograde products or toxins which are being constantly formed in the body. Nor is this all, for by lessening the oxygen-carrying power of the blood it prevents the burning up of these waste materials and toxins, and thereby interferes with functional activity, besides poisoning the system.

Viewed in the light of these facts, the so-called conservation of the tissues produced by alcohol, instead of being an advantage, as so generally taught, is, I believe, a matter of very serious import to many a patient. With the assimilation of the life-giving material impeded, and the elimination of death-dealing poisons retarded, the only explanation I can find for the widespread belief in the beneficial effects of alcohol is the tendency of the medical profession to conservatism. It is so easy to float with the current; it is so pleasant to advocate those doctrines transmitted by generations of ancestors and which have become so strongly ingrained in our natures as to be a part of our mental being; it is so hard to stem adverse currents and fight against the opinions and dicta of the many; it is so unpleasant to strive against inherited cravings and boldly to determine to make truth our guiding star, that the wonder is that any progress has ever been made. But while this is true, and all human progress and advancement are conditioned on the overcoming of these difficulties, the Creator of the universe has implanted in the minds of some rare spirits such a longing for the truth, such a desire to penetrate the arcana of nature, that they boldly face all difficulties, overcome all obstacles and never give up the fight until the banner of truth proudly floats over the innermost stronghold of error. I am happy to say that in the solution of this great problem our own ASSOCIATION has taken an active and commanding part, and among the gallant standard-bearers none occupies a higher position than the Nestor of our profession, the revered and beloved N. S. Davis.

EFFECT ON THE MUSCULAR SYSTEM.

For ages the almost universal impression has been that alcohol gives muscular force; that it enables man to do more work, to undergo greater hardships, to withstand greater cold and heat than he could without it. Accurate scientific investigations with the dynamometer and other instruments of precision have, however, positively demonstrated the fallacy of this impression. As Dr. Bunge has very cogently stated, "thousands of experiments upon large bodies of men have been made and have led to the result that in peace or in war, in heat, cold or rain, soldiers are better able to endure the fatigues of the most exhausting marches when they are not allowed any

alcohol. A similar result is observed in the navies and on the thousands of commercial vessels belonging to England and America, which put to sea without a drop of alcohol. Most whalers are manned by total abstainers."[20] Arctic explorers endure the severe cold much better when they abstain from alcohol than when they use it even in moderation. The great business interests of the country are beginning to appreciate the fact that alcohol unfits men for doing the best work. So convinced are they of this that many railroads and large manufacturing and mercantile establishments will neither employ nor retain in their employment persons addicted to the use of alcoholic beverages.

That alcohol lowers muscular force is very conclusively shown by the fact that those who engage in athletic sports must stop drinking if they expect to excel. No prize fighter, ball player, oarsman or any kind of athlete can keep up drinking habits without so injuring himself in a few years that he is relegated to the rear as "a back number." This is understood by all trainers and has impressed itself so strongly, that, even in beer-drinking Germany, the favorite national beverage is being discredited by athletes. "It is stated that three clubs of Leipsic students have abandoned the 'morning drinking bout,' and that several additional university clubs are about to take the same step. The desire to excel in all athletic sports is said to be the impelling cause of this action on their part." This practical acknowledgement that beer drinking is inimical to the best physical condition and to the highest degree of athletic success would be significant in any country, but is especially so in Germany, the great beer-drinking country of the world. Careful experiments made on a number of persons by Dr. Kellogg several years ago showed that muscular strength is diminished more than 30 per cent. by the use of alcohol, and the same author declares that nothing could be more absurd than the administration of mixtures containing alcohol when tonic effects are desired.[19]

The careful and elaborate experiments made on dogs by Prof. C. F. Hodge (*Pop. Science Monthly*, April, 1897) showed not only a marked diminution in muscular activity, but a greatly lessened power of endurance on the part of the dogs that received alcohol.

EFFECT ON THE SPECIAL SENSES.

Careful experimental investigations as well as everyday practical experience have demonstrated the fact that alcohol reduces the power and functional activity of the special senses, besides so perverting the action of the nerve centers and interfering with transmission to and from the periphery, that correct impressions of objective phenemena can not be obtained. The acuity of vision is lowered, the power of hearing reduced, the sense of smell blunted and the taste so obtunded that fiery and even caustic liquids can be swallowed without wincing. When carried to the stage of complete narcotism the functions of the special senses are for the time being lost and those "gateways of the soul" which are given us for protection are closed, and the man—deprived of sensation, motion and the power to see, hear, taste, smell or feel—lies before us, a mere vegetating mass, with barely enough respiration and circulation to sustain life, and if the narcotism is carried too far these stop too and he dies.

EFFECT ON THE NERVOUS SYSTEM.

But while alcohol retards digestion, impedes assimilation and excretion, reduces the oxygen-carrying power of the blood, and inhibits the nutrition of the cells and tissues of the whole body, still it is on the nervous system that its most far-reaching and malign influences are exerted. According to Dr. George Harley,[22] it acts on nervous tissue in three distinctively different ways: "Firstly, through its chemic action on the blood; second, by disordering the liver's functions and causing the bile to accumulate in the circulation, thereby poisoning the brain and nerves, and thirdly, by its accelerating the heart's action and thus sending an increased supply of blood to the brain."

Dr. Norman Kerr[23] writes as follows: "Alcohol paralyzes the vasomotor nerves, and thereby relaxes control over the vesels so that these dilate and allow more arterial blood to pass to the brain. With this superabundant supply of blood there is great activity of function. This is the stage of exhilaration, excitement, brilliancy, sometimes frenzy and delirium. Owing to the loss of the contractile power of the vessels the increased blood-supply can not be returned to the veins from the brain with sufficient rapidity, and thus there is a block, causing impediment of the circulation, which ought to be free and unimpeded to allow of duly aërated, fresh arterial supplies; this is the stage of depression—of depression and collapse, when the brilliancy dies away; memory fades, speech is thickened, voluntary movement ceases, sensation is dulled and consciousness fails. This process, frequently repeated, sets up permanent tissue changes. The covering envelope is thickened and otherwise so injured that proper nutriment can not be conveyed to the brain, and thus that organ is badly nourished. The shape of the brain-cells is altered, and the physical degradation of the cerebral substances sadly impairs the intellectual and moral faculties."

Dr. B. W. Richardson says: "It has four distinct effects on the nervous system: 1, simple exhilaration or excitement, caused by paralysis of nerves controlling the supply of blood; 2, muscular weakness or lack of control of one's movements; 3, mental debility, involving the weakening of the will, judgment and reason; 4, unconsciousness, with entire prostration of the body, stupor and delirium tremens;" and Dr. N. S. Davis states that "alcohol diminishes nerve force, sensibility and the action of the nerve centers in direct proportion to the amount entering into the blood."

"The excitement of all natural stimulants is not necessarily followed by a corresponding depression, but it is the inevitable result of alcohol and all other narcotic stimulants, that they are followed by depression more than equal to the excitement produced, so that a person using narcotic stimulants is more depressed than ever, and, therefore, is more inclined to repeat and increase the dose."[24] And I desire to add that this tendency of alcoholic beverages and other narcotics to create a craving which only *their use* in increasingly larger doses can satisfy, is one of the great dangers connected with their use. Time will not permit me even to allude to the many pathologic changes or diseases that result from the excessive or long-continued use of alcohol in any of its many forms. Enough has been said, however, to show that it seriously interferes with the nutritive and assimi-

lative functions, even in the adult, and how much more serious must its effects be on the growing child or youth, whose normal development is conditioned on the possession of pure, rich, properly oxygenated blood, active assimilation and unimpeded elimination? If it reduces muscular power and activity in the adult, how much more serious must its effects be on the rapidly developing muscular system of the youth! If it reduces the power of the special senses and so perverts sensation and interferes with the ability of the mind correctly to interpret the actual condition of the physical and mental powers in the adult, how great must be the injury it inflicts on the immature muscular system, and how terrible its effects on the nervous system of the growing boy!

EFFECTS ON THE MIND.

In view of the foregoing effects on the physical organization, the question naturally arises, How does alcohol affect the mind? What influence does it exert on the immortal part of man? If human experience and observation have ever incontrovertibly established any truth, I believe they have proved that alcohol dulls and perverts the perceptive powers, deranges the emotions, beclouds the intellect and inhibits and paralyzes the will. "The will is always lessened in force and activity. The ability to determine between two or more alternatives, to resolve to act when action is necessary, no longer exists in full power, and the individual becomes vacillating, uncertain, the prey to various passions and to the influence of vicious counsels."[25] "The more purely intellectual faculties of the mind rarely escape being involved in the general disturbance caused by alcohol. The power of application, of appreciating the bearing of facts, of drawing distinctions, of exercising judgment aright and even of comprehension, are all, more or less, impaired. The sense of right or justice, which the individual may have had, is so weakened or destroyed that he will lie or steal or commit murder or other outrages, even where there is no provocation." "The memory is among the first faculties to suffer,"[26] writes Dr. Wm. A. Hammond; and Dr. August Forel of Zürich, says: "The poisoning of the brain by alcohol is all pervasive. We need not descend to the drunkard. In looking at the moderate drinker we see that his sensibilities are less fine, he cares less for the strict truth, he is more negligent of the proprieties and less active mentally."[27] Nor is this all, for "under alcoholic influence the brain begins to think awry. It can not think straight,"[28] and its influence on the psychical processes is curious, for while it renders them much slower, the individual under its influence believes them to be much quicker than usual."[29] Indeed, experiments made in Heidelberg University show that the consumption of alcohol, whether in large or small doses, produces a tendency to paralysis of the mental faculties.[30] And still, many would excuse free indulgence in alcohol on the ground that it is necessary to arouse the mind, to cause thought to flow freely, to stir latent genius into brilliant activity, or awaken the slumbering muse and snatch undying fame from Parnassean heights. Stuff and nonsense! The genius that will not illuminate without alcohol, had better be left to "innocuous desuetude," to take its place with the "mute inglorious Miltons" of the past, and the muse whose celestial fire can only be stirred into an active flame by means of whisky, brandy or even champagne, is at best but a sorry jade, and had better be allowed to slumber peacefully on. If the experience and investigations of the most eminent physiologists and thinkers are of any value, more long-continued, arduous and severe mental work can be accomplished without alcohol than when it is taken, even in small amounts. On this subject Prof. C. F. Hodge writes as follows: "Helmholtz has said in describing his methods of work that slight indulgence in alcoholic drinks dispelled instantly his best ideas." Prof. Gaule once told the writer as an experiment during the strain of his "Staats-examen" that he suddenly stopped his wine and beer and was surprised to find how much better he could work. An eminent professor of Leipsic once said that the German students could do twice the amount of work ("Konnten zwei mal so viel leisten") if they would let their beer alone. Dr. August Smith has found that "moderate, non-intoxicant doses of alcohol (forty to eighty c.c. daily) lowered psychic ability to memorize as much as 70 per cent."[31]

EFFECT ON THE MORAL NATURE.

As pointed out in the foregoing quotations, alcohol blunts the finer sensibilities and dulls the moral perceptions so that the regard for truth, justice and the rights of others is greatly lessened. Indeed, it is a matter of common observation that old habitués are entirely unreliable, and in many cases their most sacred pledges are utterly worthless. So thoroughly are they in the power of an insatiable appetite, and so absolutely are they enslaved by it, that they would violate their most solemn promises, yea, even, if such a thing were possible, would barter their immortal souls for a glass of whiskey. This, together with the fact that a large percentage of the crimes committed are directly or indirectly due to indulgence in alcoholic liquors, should lead to the most stringent measures to protect the children and youth of our land against their blighting influences. These protecting influences, stimulated by a thorough physiologic knowledge and an aroused conscience, should originate in the home, be continued and strengthened in the schools, and strongly reinforced by the legislatures and courts of our land, and finally should receive the unqualified and earnest support of every physician. When we consider the strong inherent craving for alcoholic beverages in the human race and the powerful inherited tendency (latent though it be) in such a large percentage of persons, I do not believe any physician is justified in using alcohol in the treatment of any case of disease, unless, after a careful investigation, he is convinced that no other remedy will answer just as well. If such a course were conscientiously pursued, I predict that alcohol would soon be reduced to a very limited sphere, because I believe that nearly every disease in which it is now so extensively used could be treated better without it, and the medical profession be spared the odium of producing so many drunkards. The same is true of opium and other narcotic poisons which are now so extensively, indiscriminately and unfortunately — I think needlessly — used. If we would devote more time to securing a clear conception of the great laws regulating physiologic activity; to ascertaining the causes of diseases and trying to remove them, or assist nature in overcoming their effects, instead of merely administering a narcotic dose to cover up the painful symptoms, we would do a great deal more permanent good and not lay our-

selves open to the imputation of having done much harm.

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DISCUSSION.

Dr. SLAGLE of Minneapolis—In regard to tobacco, the bad effects of it, of course, can hardly be exaggerated. The subject brought to my mind an experience I had when I started out in the practice of medicine, about 1861. Among my first cases I had a baby that was very ill. On my first visit it had turned suddenly worse. The symptoms were all bad: sweating, almost pulseless, and I at once made an unfavorable positive prognosis that the child was dying. I did not observe that a lot of old ladies had gathered in and had been smoking. The house was full of tobacco fumes. I gave the case up and was going to visit a relative some miles away. I returned in the morning and my patient was better, and recovered. Then I searched for the cause and found it was the fumes of tobacco with which the room was filled which depressed the child and came near killing it, and caused me to make the blunder in prognosis.

In regard to the use of alcoholic stimulants, I do not like to hear Dr. B. W. Richardson quoted, eminent as he was; I think that he went to extremes. The more I practice medicine the more I give alcoholic stimulants in certain diseases, and I am sure with good effect. Of course, no one can exaggerate the baneful effect of the excessive use of alcoholic stimulants. But in the practice of medicine, especially with children, I am sure it is a good therapeutic agent. I believe it is, when properly used in properly selected cases, a valuable agent. As to its injuring digestion, that is a mooted question; there are good authorities on both sides. I am sure it does not always injure digestion. I hoped the essayist would speak of opium. The more I practice medicine, and my department is diseases of children almost entirely, the more cautious I am of using opiates in any form in diseases of young children. Indeed, I use opium very little. I may state that in the earlier days of my professional experience I saw great harm from it. I am even willing to admit that I believe I killed some with it. It is a very dangerous agent to use in diseases of children, and I find we can get along without it. Those of the rising generation are less excusable, perhaps, for its use than we of forty years ago. We have now many remedies that were unknown then, that take its place.

Dr. LOUIS J. LAUTENBACH, Philadelphia—Up to the present time the youngest age of any one who has been found the subject of tobacco blindness has been 19 years of age. This afternoon I expect to report a case I saw 13 years of age, and since then I have found a number of cases of about that age and from there on, and I find, from the influence of tobacco on the system, that these cases are very common indeed. I for one am very much in favor of the enactment of certain laws in regard to the use of tobacco. If we face honestly the two questions of alcoholism and tobacco, we will find that tobacco exerts the greater harm. It is not easy to think so, for we have been taught differently. We can use alcohol in reason and it will do good, but upon the young I have never seen any case where the use of tobacco has done any good, but I have seen numberless cases in which it has done harm. You go through the streets of our larger cities and notice the young boys smoking and you will see certain characteristics caused by the use of tobacco. I think before long we will have laws prohibiting the use of tobacco by minors. In the case I mentioned, the vision was about 1 5; the patient was a boy about 13 years of age, rather tall, and he had been following the habit about a year. His heart's action was very irregular. When the tobacco was stopped, the vision became 6/9, showing the influence of the tobacco on the vision. I do believe tobacco has not been talked about more because it is one of our pet vices. I find it far more difficult to get patients to stop the use of tobacco than to stop the use of alcohol.

Dr. JOHN RIDLON, Chicago—I simply wish to say a word in protest against the universal application of the conclusions in the paper read. Of course, the conclusions of the essayist are correct in a measure, but they are incorrect in their general application. Now, as to tobacco, I don't know what I would have been had I not commenced smoking at 13. As far as the effect of alcohol on digestion is concerned, it is true alcohol delays digestion, but it is not necessary to conclude therefrom that it is harmful to the individual. Delayed digestion often makes more perfect digestion. The patient may suffer difficulty from the digestion being completed before the digestive process has ceased. There can be no question that alcohol often is an advantage and help in digestion, not because it hastens digestion but because it delays digestion.

Dr. R. B. GILBERT, Louisville—I heartily agree with every word that has been said here about tobacco. I come from a State that boasts of its tobacco and whisky, and Kentucy probably would not thank me for saying a word against tobacco; but I have written against it, and I have not missed an opportunity to speak against it. It gave me dyspepsia and everything else until I quit it. It reduced my weight to 120 pounds. The point the gentleman makes in his paper is one we should pay considerable attention to. We should educate the public mind on the evil effect of the tobacco habit on the infants and children of our nation. I believe today, sir, that the degenerated condition of the country that is at war with us, is due as much, if not more, to their use of tobacco than to any other one vice they have. We should go back to the ancestry to find the cause of the ill effect on the children. I have found one or two children of such a family have a nervous temperament, even sometimes to such an extent that they could not follow the ordinary course of the common schools, many of them becoming epileptic. That is not all; it has a degenerating effect upon the moral character. The average tobacco user defends himself by saying it is a luxury and a pleasure. I know old farmers in my country, apparently hearty and hale, although they use whisky, but they are the exceptions. I want to say a word about the use of tobacco among doctors, especially those who practice obstetrics. I know a case in which I believe the doctor killed the child by blowing his breath into its face to resuscitate it. The doctor's breath was reeking with tobacco, and he blew his breath into the child's face to inflate the child's lungs. The child died, and on autopsy we could find nothin

to account for the death. No obstetrician knows what moment he may have to use artificial respiration.

DR. E. STUVER, Rawlins, Wyo., in closing—I fully understand the fact that tobacco may have its proper usage; I believe, however, that the proper use of tobacco is in the exceptional case, and not in the general rule for mankind. Tobacco should not be used by the young. Of course, my discussion took up the general physiologic effects of tobacco. But the special application is that in the growing boy, tobacco retards growth not only of the muscular system and the nervous system, it not only interferes with digestion and impedes the elimination of toxic products from the system but it interferes with the whole development of the child in every particular, morally and intellectually as well as physically. If I had the time to complete my discussion of the alcoholic question, some of the reasons would have been seen for my objections to alcohol, especially for the young. We see many of the effects of alcohol in the young not due to its direct use, but due to the use of alcohol by the ancestors. While I am glad to know one of the gentlemen claims to get good results from alcohol, yet the more I practice the more I find I can get good results without alcohol. I can get better results from strychnia than from alcohol, in a case of pneumonia or any other condition of lowered vitality.

GASTRO-INTESTINAL CHOLERIFORM CATARRH.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY EDWARD L. DAVID, A.B., M.D.

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Of the various titles, as cholera infantum, infectious diarrhea, choleriform diarrhea, summer diarrhea, summer complaint, acute mycotic diarrhea, by which this disease is known, none are as expressive as gastro-intestinal choleriform catarrh, for none designate as much at the outset, of the extent and character of its manifestations or variety of its action; summer complaint and summer diarrhea especially should not be used, they being indefinite and meaningless. The tendency of giving a number of names to a single disease should be overcome; be simple and comprehensive so no misunderstanding will be possible; avoid a variety of synonyms; they are confusing to physicians in general, who have not this knowledge at their command—knowledge which is tedious and unnecessary, and often leading to serious mistakes.

Gastro-intestinal choleriform catarrh, while not of common occurrence compared to other diarrheal disorders, is relatively frequent in children under 2 years of age; is of short duration and frightful severity. Occurring as it does in children of such a tender age, weak and easily overcome, it is incumbent on us to know it thoroughly, recognize it early, that we may treat it vigorously and properly. It is now generally accepted that the exciting cause of this disorder is bacteria, the exact nature of which is undetermined; whether introduced into the system with impure food or residing in intestines, and made capable of exerting their destructive processes by being transformed into pathogenic germs or forming ptomains is a question to solve, on which our energies should be directed. Accepting that bacteria is the cause, we are certain that their action is limited to certain periods of the year, not exerting their influence during very cold months—of twenty-six cases none occurred during December, January nor February—on the other hand, the prevalence of the disease during June, July and August would tend to the belief that during a high temperature, the bacteria are especially numerous or active, or changes in the body are such as to especially invite their inroads. Dr. L. Emmett Holt, in his splendid work, "Diarrheal Diseases," draws the inference that "it is not the bacteria directly which produce the lesions, but their ptomains, and, further, that the action of the latter is principally on the blood-vessels." Assuming Holt's inference to be correct, as from our present knowledge it appears to be, what are the causes predisposing to the formation of the ptomains?

Knowing that bacteria exist in the intestinal canal in health, without detriment to normal conditions, anything which changes the healthy tissue or otherwise forms a medium for their development or action would be a predisposing cause.

That there is a distinct connection between occurrence of this disease and condition of temperature can not be questioned; occurring only during warm periods and absent during very cold establishes beyond doubt such a relation; whether it is the life of the germ, the normal resistance of the child, or that food undergoes putrefaction to a much greater degree, or that increase of unhealthy surroundings favor the micro-organism, is yet to be decided. My observation of twenty-six cases were as follows:

April 1, May 1, June 5, July 10, August 6, September 2, October 1.

According to the age the cases occurred as follows: First six months; 2; second six months, 7; third six months, 9: fourth six months, 5; between 2 and 3 years, 3.

There are several reasons for frequency in infancy, one which is seldom emphasized being the natural tendency—from weakness of a child of such a tender age—to succumb to the inroads of any irritant or its inability to resist an irritant. But standing above all other causes excepting bacteria, is that old enemy of the infant, which seems to wax stronger as time goes on—improper feeding; it is worthy of note in this connection that the child so fortunate as to be nourished at the breast escapes this dread disorder, with rare exceptions. Reasoning from this fact, what is more probable than that food is the vehicle by which bacteria are introduced, a nidus for their development, or causes changes in the mucous membrane favorable to their action? For instance, in over-feeding, the organs of digestion are overtaxed by the increased work and their power gradually diminished; there remains in the intestines a quantity of undigested food which undergoes decomposition, irritating and causing a change in the normal state of the intestines, and a culture in which the bacteria may produce their evils. There is scarcely an infant which is bottle fed that escapes diarrhea during the first two years of its existence. Improper food of any kind, over-feeding, unhealthy source of obtaining milk, are self-evident reasons for this; meats, vegetable, fruits, are common causes and should be prohibited, because the infant is unable to digest such food. We should carefully guard against all irritating ingesta, animal or vegetable, and more so, if not strictly fresh; the ptomains may be introduced in the food and not formed in the intestines, though the latter appears to be in general the modus operandi. In conjunction with other results of high

temperature the difficulty of obtaining pure milk, rapid decomposition of food, and the desire for more liquids on the part of the child resulting from excessive heat, should be borne in mind.

One other fact in this connection of feeding, one which was first called attention to by Dr. R. B. Gilbert: the sexual act causes colostrium to be present in milk; this is irritating, difficult to digest, and has a laxative effect; in two cases I could trace cause to no source except this. Pregnancy and menstruation in mother nursing child may cause diarrhea; indiscretion in eating or medicines to mother; the latter may also be the cause in the child; a laxative to overcome constipation continued too long is more commonly a cause than generally credited.

Unhealthy surroundings predispose by increasing the liability of contamination of food and drink, or rendering child less capable of resisting by the impoverished air impairing the blood to a greater or less degree, and to the fact of the freer contamination increasing number of bacteria or forming ptomains. Dentition is an exploded cause, excluded by the occurrence of this disease mostly in warm weather and seldom in cold, while if it was causative the disorder would be met with at all times without regard to season or temperature. Sudden exposure to cold would only act by lowering the standard of resistance; in itself it would be no detriment as far as this trouble is concerned.

Any disease present may predispose to this diarrheal affection in like manner to surroundings, by placing the system in a more receptive condition to accept the contagion. This form of diarrhea often follows other and slighter intestinal disorders, the reason for which is apparent, the local irritating effect of the milder form being prone to render the mucous membrane of intestines more or less unhealthy and particularly affected by the action of the bacteria.

It is unfortunate that there is so little definite knowledge of the anatomic changes occurring; for a disease is best studied in relation with its pathology; there are but few cases that are reported and these only partly satisfactory. This lack of facts is due chiefly to the rapid course of the disease with but slight changes compared to intensity of symptoms, the disability to obtain consent for postmortems before cadaveric changes occur, or to different modes of beginning of the disease. There would necessarily be a different state of the gastro-intestinal tract in a case following a previous diarrhea to that in which this disease is independent of any other form of trouble. According to Rilliet and Barthez the following is a summary of the anatomico-pathologic changes divided in four states, *a* "either the stomach is softened without any lesion of digestive tube; *b*, or the stomach is softened at the same time that the mucous membrane of the intestines, and especially the follicular apparatus is diseased; *c*, or, the stomach is healthy, while the follicular apparatus or the mucous membrane is diseased; *d*, or, finally, the gastro-intestinal tube is not the seat of any lesion appreciable to our senses in the present state of our knowledge, or it presents lesions so insignificant that they are not sufficient to explain the gravity of the symptoms. "So far, the disease resembles all the catarrhs, but what is special is the abundance of serous secretion and the disturbance of the great sympathetic nerve." The salivary glands are especially affected, becoming enlarged; and micro-organisms are found, which however, indicate but little, as bacteria abound in the intestines in health. If the disease lasts longer than usual there are more decided changes; proliferation of cells in the glands which open on the surface and also from the ductless glands; the degeneration of the epithelium resulting in erosions which expose the basement membrane, or if the disease is protracted, loss of substance is still greater, forming follicular ulcers; if it has lasted a long time a hyperplasia of the connective tissue with thickening of the mucous membrane or formation of mucous polypi. May have cysts formed by an agglutination at the orifice of a follicle. Of the changes in other organs nothing has been noted save in blood; there is decided lessening in the quantity of the blood and in its solid ingredients, resulting in the terrible anemia which occurs so speedily; also may have evidence of hypostatic congestion.

However, the changes in a typic case of gastro-intestinal choleriform catarrh, to our definite knowledge, are those of an acute catarrhal inflammation. Generally a child has a diarrhea and little attention is given it, perhaps four or five actions in the day, when, without warning, it is seized with vomiting or the stools are greatly increased in number, and the character changed to that peculiar sort which typifies this disease. Or, less frequently, the characteristic diarrhea begins suddenly—at first the stools having a little fecal matter in them, but soon they change to the rice-water discharges similar to those occurring in Asiatic cholera; these are colorless, generally odorless, serous in character and of large amount, occurring twenty to thirty times or even more in a day. If the stomach is chiefly involved, vomiting precedes the diarrhea, but generally the intestinal symptoms occur first. The vomit consists first of tho contents of the stomach, or any food taken, then is slimy, containing mucus and serum, and finally, from retching, biliary matters are regurgitated and vomited.

In all my cases these two symptoms occurred, the intestinal one generally coming first, at times the two together, exceptionally the vomiting first. Intense thirst from drain on blood-vessels; colicky pains; tenderness and retraction of abdomen; often rumbling in bowels. Child restless, depressed, irritable, refuses everything save cold drinks, which are almost immediately vomited; pains in muscles, especially of neck. Voice weak and hoarse; tongue at first coated, following diarrhea is very dry; rapid and great emaciation, sunken eyes with lids partly open; face pale; skin loose, with prominence of the bony points of the body, extremities cold and moist. Pulse is extremely rapid, from 140 to 175 per minute, weak and irregular, may be impossible to count; finally may become so small as to be imperceptible. Respiration is increased in frequency, labored and irregular. Temperature varies from 103 to 107 degrees in typic cases.

If the case terminates fatally, child has convulsions; urine scanty or suppressed; marked stupor, pays no attention to surroundings; face cyanotic; cold, clammy skin; fontanelles sunken; pulse imperceptible; respiration accelerated and shallow; hyperpyrexia generally, but may be subnormal temperature; state of coma. In favorable cases there is a gradual abatement of the symptoms, may become an ordinary diarrhea or merge into a decidedly inflammatory one; first vomiting ceases, then change of stools, becoming more fecal in character. There is seldom recovery after the more severe, especially cerebral, symptoms occur.

The prognosis is decidedly unfavorable, depending on age, surroundings, previous health, whether bottle-

fed or by breast, and especially on severity of attack. Of the twenty-six cases which I reported seventeen died, or about 65 per cent. The duration is generally from twenty-four to forty-eight hours. As to diagnosis there can be no doubt. There is no disease which presents this marked group of symptoms in the brief time that this does; other diarrheal affections which simulate this run a much longer course; Asiatic cholera is differentiated by its longer course and presence of comma bacillus.

Treatment.—If possible, a child not breast-fed should be taken to the country during the summer months, or daily to the parks which are to be found in every city of any pretensions. The room should be large, well aired, of an even temperature, in which the child is kept; no foul-smelling articles of any description should be left near the child, all vomit and discharges destroyed, preferably by burning. The diet should be carefully chosen and carefully given, a suitable amount at regular intervals; above all, avoid overfeeding and restrict to a milk diet, previously boiled if possible; in those in which milk disagrees, barley is an excellent substitute, boiled, strained, and with a pinch of salt added, but as little food as possible should be given during the acme of the disease. Any derangement of stomach or bowels, however slight, should be promptly and vigorously treated, bearing in mind that in the generality of cases gastro-intestinal choleriform catarrh follows a milder form of diarrhea. In children nursed at breast the mother must be forbidden to nurse the child within three or four hours after coition, as colostrium is likely to excite a diarrhea.

From violence of symptoms, rapidity of course and unfavorable prognosis, the indication is decided treatment from the onset; the child should be seen every hour, or better, if possible, for the physician to remain at its bedside during the height of the disease, or for as long a time as his other duties will permit; often immediate attention turns the tide to a favorable course and he may be able to save the little sufferer; it is my custom, whenever applicable, to remain with the patient the entire night and as much of the day as time will allow. For the vomiting paregoric, creosote, iced champagne or brandy by mouth, or if vomited, by rectum; if this is unsuccessful a hypodermic of morphin may be tried—but is contraindicated after the symptoms of collapse begin. In addition to vomiting opium is good for the diarrhea, restlessness, pain and tenesmus, but should be stopped if drowsiness comes on. For the diarrhea, bismuth has given by far the best results; it is an antiseptic and an astringent—two qualities which serve our need especially; opium by lessening peristalsis; lime-water or some other alkaline to neutralize the acidity; pepsin to aid digestion and prevent decomposition of food and formation of gases and acids.

The only method I ever adopt of reducing temperature is by cold baths or applications—place child in a bath a few degrees below that of the temperature of the body, and then by addition of ice the water is cooled a few degrees, being satisfied with moderate improvement in this regard. This is the best and safest plan; fever is reduced thus only a short time, and the baths should be repeated as often as indicated by a hyperpyrexia.

For the pain and tenesmus the application of counter-irritation is valuable, as it lessens amount of medicine necessary to be given internally; a piece of flannel folded four times and large enough to cover abdomen is dipped in hot sweet oil or lard, to which about a half a teaspoonful of turpentine has been added, and applied, covered with oiled silk and a cloth, is an excellent method. A remedy which has proved of great value to me in these cases is creosote, it is carminative, antiseptic, astringent, is sedative to mucous membrane of the stomach (acting on terminal nerve filaments probably), indications which it is necessary to meet; I give it in one drop doses every two hours combined with bismuth, pepsin and paregoric. For nervous irritation or cerebral congestion bromid of potassium is good, but must be used cautiously lest it excite more violent vomiting, it being decidedly irritant in some cases. For threatened collapse nothing equals whisky or brandy, ten to twenty drops per hour; in addition to this hot baths with addition of mustard, injections of camphor and atropia, the latter especially if the collapse is threatened from the heart.

It is best to give whisky or brandy throughout the disease frequently; if not tolerated by stomach give by hypodermic method; I have used alkaline solutions and, I believe, with benefit, hypodermatically, a 1 per cent. solution; or per rectum, 3 or 4 per cent. solution. We can not be too careful during convalescence. A slow, gradual increase in the amount of food, given either predigested; or better, with a digestant and an antiseptic. The following formula has been of the greatest benefit during the acute stage of this trouble, before stupor comes on or collapse is threatened:

R	Creasoti	m xii	070
	Tr. opii camph	ʒ ss	15 50
	Bismuthi subnit.	ʒ iii	11 66
	Pepsini scalæ.	ʒ i	3 88
	Syr. Aurantii cort.	ʒ ss	15 50
	Aquæ menth. pip., qs., ad.	ʒ iii	93 30

Mix. Sig. Teaspoonful every two hours to a child one year of age, vary with age and severity of symptoms.

In conclusion, I wish to emphasize several points: Move child to country during warm months whenever possible, especially if under three years of age. Do not think it necessary that food be given during height of disease; it is better to give no nourishment for twenty-four hours than to risk aggravating symptoms. Be in almost constant attendance on patient. Give stimulants from the beginning, but no opium if least sign of stupor present, especially not hypodermatically. The strictest hygiene must be observed.

IS THE USE OF THE TERM "TYPHOID PNEUMONIA" JUSTIFIABLE? A CASE IN POINT.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY H. D. TULEY, M.D.

LOUISVILLE, KY.

The title of this paper was suggested by the following case, the postmortem findings of which made the original diagnosis recorded incorrect:

The child was a robust girl, 13 years of age; seen first on Jan. 30, 1898, she having had a chill on the two previous days, with a maximum temperature on the first day of 101⅘ degrees and on the second day 103⅘. From this time to the eleventh day, all of the symptoms were those of typhoid fever, and the diagnosis was so recorded. There had been a general malaise for several days before the first chill; the headache was quite severe, gradually improving as the second week approached; the tongue was heavily coated a brownish yellow, with red edges and tip, but was moist; slight abdominal tenderness at first low down and a little to the left of the median line, right sided tenderness with gurgling soon developing; dry skin; epistaxis; cough quite severe and annoying at times; moderate

temperature, from 101 to 102, pulse 120 to 125; rose-colored spots appeared about ninth day, typic diarrhea during second week.

On the tenth day the temperature rose one degree, the pulse to 140 and the respiration to 50, but the chest still negative. Frequent examinations carefully made had up to this time failed to reveal anything abnormal. On the twelfth day signs of consolidation were found in the right base near the angle of the scapula, this gradually extending until the most of both lungs were involved. Despite free stimulation, administration of strychnia and nitroglycerin, and free administration of oxygen, her condition gradually became worse and she died in the state of severe cyanosis on the nineteenth day of her illness.

For four days before her death there was a severe diarrhea, which rather tended to strengthen the original diagnosis of typhoid fever, complicated by a pneumonia.

Autopsy three hours after death. Lungs almost completely consolidated, save a small area along the anterior borders of both. A small area of pleuritic adhesions was found at the left apex posteriorly. Spleen was normal, liver also. Intestines pale, with some distention of the upper ileum, the lower portion being collapsed and empty. The small gut was entirely normal, save a very slight evidence of congestion about the lower one-third. Enlargement of the mesenteric glands of the lower ilium, none however larger than a pea. Colon normal. Bacteriologic examination of the lungs showed presence of diplococcus pneumonia, with no other organisms present.

In the recent literature on the subject of typhoid fever, by several authors, notably Osler, a great deal of stress is being laid on the occurrence of typhoid fever without intestinal lesions. In the case just related many of the symptoms pointed to a typhoid fever, enough certainly, unconfirmed by the Widal test or diazo-reaction, which were thought unnecessary in view of the symptoms present, yet no lesions save slight mesenteric gland enlargement were to be found in the abdomen.

As to the pneumonia. The child was seriously sick for ten days before any signs were apparent in the chest, and no symptoms save the cough that would lead one to think of pneumonia, an annoying symptom which is frequently present, in the writer's experience, in typhoid fever occurring in children. The question to be settled, and which I trust will be brought out in the discussion is, was this a case of typhoid fever—*sine* intestinal lesions—complicated with pneumonia; was it a case of continued fever with a coincident pneumonia; was it a central pneumonia from the beginning with manifestations in the chest delayed until the eleventh day, or shall we class it as a typhoid pneumonia?

Osler states that "the term typhoid pneumonia is commonly used to designate cases with adynamic symptoms and it is to be distinguished from those cases in which typhoid fever begins with a definite pneumonia, the so-called *pneumo-typhus* of foreign writers." Tyson refers to typhoid pneumonia in the following: "The term typhoid pneumonia is one in common use by many who have no definite notion of its meaning, and, like the term typho-malarial, has occasioned confusion. In the first place the case may begin as a lobar pneumonia, the intestinal symptoms appearing at the end of the first week or later, at which time also the spots may appear, establishing the diagnosis, while the usual crisis of pneumonia fails to make its appearance. Again, a pneumonia may supervene in the second or third week of typhoid fever as a complication in which the true relation is less difficult to determine. Finally there may be a true pneumonia, to which stupor, a dry tongue, and generally adynamia may be added, without the distinctive lesions of typhoid fever. This is true typhoid pneumonia, which it may not always be possible to separate from the typhoid fever beginning with a pneumonia. Both of the forms of pneumonia may be caused by the typhoid bacillus or the pneumococcus."

Many interesting points are suggested by the history of this case, which would perhaps enlarge the scope of the discussion, as the use of oxygen in pneumonia, hydrotherapy, etc., but these points have been purposely omitted by the writer that this one may be the more fully discussed. Is the use of the term "typhoid pneumonia" justifiable?

It occurs to the writer that its use in the case related, in light of the symptoms and postmortem findings is justifiable, and should be limited to such cases, but without a postmortem the term should be used with caution and extreme discretion.

DISCUSSION.

Dr. SLAGLE of Minneapolis—My experience has confirmed my first teaching in the University of Louisville, that we have typhoid-pneumonia, properly so-called, and that we have typhoid fever with pneumonia. I have no doubt from the very good history Dr. Tuley gave of that case, that it was originally a case of typhoid fever, sine lesions of the intestines, which can occur, the pneumonia supervening later on; that it was not a case of typho-pneumonia, although I believe that is a proper term. I have seen made cases of typhoid fever, with pneumonia supervening. In regard to the diagnosis of typhoid fever in young children: My experience is that it is one of the most difficult problems in diagnosis to at all times correctly diagnosticate typhoid fever in young children. There are a number of very good physicians who dispute that very young children ever have typhoid fever. I am sure I have seen at least two cases of typhoid fever in infants, one about a year old and the other about eighteen months. They both occurred during an epidemic of typhoid fever in our city, Minneapolis. We had between four and five hundred cases of genuine typhoid fever in Minneapolis. The remarkable part of it was that it was an epidemic of typhoid fever during what is supposed to be the healthy season of the year, the only instance of an epidemic of typhoid fever that I have seen in the winter time. We did not succeed in finding the cause of the epidemic. Some attributed it to the water, but that was not proven to be the cause; at least many of us were skeptical about that. There were some cases of typhoid fever in quite young children. One case I was called to see, which others had seen, and the point hinged on the diagnosis. I am satisfied from the symptoms present and the way the case ran that it was a case of genuine typhoid fever in a child twelve months old, whose mother had just recovered from typhoid fever and had been nursing it. I have found it one of the most difficult things in all the field of diagnosis to make a definite diagnosis of typhoid fever, at least anything like early, in young children, and to differentiate it from meningitis or from influenza or from certain bowel troubles.

Dr. J. P. CROZER GRIFFITH, Philadelphia—Some of you who have been reading the papers know that Philadelphia has the great honor of having about four or five times as much typhoid fever as any other city in the United States. During the past year we have had a shocking epidemic of it. I am quite thoroughly convinced that typhoid fever is much more common in young children, even in infants, than it is ordinarily supposed to be. The New York physicians, at least many of them, have taken the ground that it is very rare. Northrup has never seen the lesions of typhoid fever in children. Recently, I had the pleasure of carrying the war into the enemy's camp, when I lectured to Dr. Northrup's students in the hospital on this subject, and narrated many cases I have seen. I have seen typhoid fever in a child three months old, which is the youngest I have known. The youngest case heretofore reported was recorded by Gerhardt a number of years ago in a child three months old. The child was in the same room

with its mother, who had typhoid fever, but who did not nurse it all, and it had the usual symptoms of typhoid fever. I have seen typhoid fever at twelve months, twice at nineteen months, and several times under two years. Many of these cases were corroborated by the spots and spleen, and others by the blood examinations repeatedly made. I saw a child last winter, of two years, with the slight lesions of child's typhoid. Two physicians of Montreal have recently written an interesting article in the Montreal *Journal*, recording nine cases which they could recognize as undoubted cases of typhoid, yet there were no lesions of typhoid fever. A curious thing is that in fetal typhoid fever there are no intestinal lesions. There were about ten cases of fetal typhoid fever reported before the recognition of the Eberth bacillus became general, that is, before you could differentiate it well from the colon bacillus. You know many mistakes at first originated in the differentiation between the Eberth bacillus and the colon bacillus. Up to the time of the possibility of the clear differentiation between these organisms, there were only about ten cases, and since then there have been about nine cases of undoubted fetal typhoid fever, the children born from typhoid mothers, all dying before or after birth, and in all cases the Eberth bacillus was differentiated. In every one of the nine cases there was a total absence of lesions in the intestine. The mesenteric glands, of course, were enlarged. I am very skeptical about the diagnosis of the case reported by Dr. Tuley as typhoid, simply because the symptoms were so developed. I have watched closely these cases of slowly developing symptoms of pneumonia a number of times until the crisis occurred.

Dr. A. C. COTTON, Chicago—I do not see any objection to the term typhoid-pneumonia as expressing a complication of typhoid fever. I don't see what objection there would be to typhoid-bronchitis. I remember looking the matter up very carefully a number of years ago in the preparation of a paper read before the Chicago society. I took a hundred cases of typhoid fever, selected only on account of the complete nature of the histories. Two-thirds of them were from hospital records, the remainder from private practice, and 68 per cent. of those cases showed positive pulmonary lesions, from mild bronchitis to pneumonia. I do not know what harm there is in saying typhoid-bronchitis as indicating a bronchitis complicating typhoid fever. I do not know that we should attach any significance pathologically to the co-existence of typhoid fever and lobar pneumonia, but I think that is a convenient way of designating the complication. If it be indisputably a case of pneumonia, the presence of pneumococcus being demonstrated at the start, and the development of unquestionable typhoid fever following, it would seem better to call it pneumo typhoid.

Dr. H. M. MCCLANAHAN, Omaha—I think if we gave more attention to the matter we would find more cases of typhoid fever in children. When we recognize that much of the typhoid fever comes from milk, there is no reason why the child should not be exposed more than the adult. There is no reason why its intestinal tract should not be more susceptible. My experience is that typhoid fever in children is comparatively mild in the majority of cases. Perhaps, first and most frequently, it is mistaken for malaria. In this day, with the aid of the microscope, that is hardly necessary. It has been said that a case of malarial fever that did not yield to quinin in a week was not malarial fever. Another fact I have observed is that the rose-colored spots do not remain as long in typhoid fever in children as they do in adults, and sometimes we overlook them. They are not as numerous and prominent, and are more evanescent in character. Constipation, rather than diarrhea, is the rule in typhoid fever of children. So less importance can be attached to diarrhea in making the diagnosis than is true in the adult. I saw a child in which a diagnosis of meningitis was made, and I think it may be stated that the symptoms of meningitis, with high fever, closely simulate those of typhoid fever. Meningitis, I think, is rather rare in children, except where it is secondary to ear trouble or something of that kind. In most cases, we may expect the cerebral symptoms to be very prominent before we can make a positive diagnosis. I think there is no doubt typhoid fever is more common in children than the older practitioners have been led to believe. I know many doctors prescribe for a child without having it undressed to examine it.

Dr. EDWIN ROSENTHAL, Philadelphia—The question was: "Is the use of the term 'Typhoid-Pneumonia' justifiable?" I take the stand that "typhoid-pneumonia" is wrong, wrong in every respect. I can not conceive that there should be two diseases under one name. The cases of typhoid fever I see are, perhaps, the worst that can be seen in the city. During the last epidemic I saw some cases in which the temperature was subnormal, the temperature falling to 96 degrees, and one case remained for one week at that degree and then rose and took its usual course. If a case of typhoid fever becomes complicated with pneumonia, the pneumonia is only an addition to it. If a man tells me he has a case of typhoid-pneumonia, I do not know whether he means that he has a typhoid fever complicated with pneumonia or a case of pneumonia that has fallen into a typhoid state.

Dr. HENRY E. TULEY, Louisville, in closing—At first we were puzzled to make the diagnosis, the rose-colored spots appearing, then pneumonia following, and the fact that on postmortem we found no lesion in the intestine was interesting. I think it is clearly understood that the prefix "typhoid" in the term "typhoid-pneumonia" refers only to the typhoid state and not to a typhoid fever. I think we should use it very carefully, and preferably, not at all. I appreciate what the chairman said about diagnosticating late pneumonias, where the signs are difficult to find although a careful examination of the chest is made. I think we should only use the term "typhoid-pneumonia" when we mean the typhoid state which has developed in a case of pneumonia.

AUTO-INFECTION VERSUS TYPHOID FEVER AS SEEN IN YOUNG CHILDREN.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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An irregular type of fever incident to auto-infection is frequently found in artificially reared children. It is also encountered in young adolescence, and may be found in breast-fed children of irregular habits. When associated with a depressed system or unhygienic surroundings the fever is most likely to assume a more protracted and intermittent type. When found in breast-fed children, the fever is suddenly ushered in at a high grade (103 to 104 degrees), very frequently sustaining this elevation of temperature for several days, when it may break into an intermittent form. The fever associated with intestinal toxemia has many times led to the diagnosis of typhoid fever, from which it can only be discriminated in young children by a careful analysis of the various symptoms, conditions and surroundings, diet and exposure, and all the many complications incident to artificial management.

The clinical picture of a child suffering from auto-infection so closely resembles those many reported cases of typhoid fever that I will attempt to discriminate between the symptoms of these two forms of fever.

In early life, the period prior to six months, excessive or improper food is usually rejected by vomiting; and consequently we do not, as a rule, find many cases suffering from acute milk poisoning, except from atmospheric causes, but shortly after this age, when the food enters the intestinal tube more freely, irregular and improper feeding finds its primary manifestations in a mild degree of irregular fever. The more intense expressions of auto-intoxication may even culminate in a severe form of nerve paralysis, as illustrated in mid-summer diarrheas. It is in the milder classes of cases, however—not in those of severe acute milk infection, as seen frequently during hot weather, nor in the wasted infant approaching general atrophy—that we meet our most troublesome problem in differential diagnosis.

The true clinical picture of auto-intoxication is most frequently found in young children suffering from a prior existing chronic intestinal catarrh. Children who have recently passed through any of the exanthemata are more prone to inherit intestinal indigestion from these eruptive disorders, and hence are more likely to contribute common examples of acute auto-infection. At the end of the first dentition, if this has been accomplished under dietetic difficulties and unfavorable environments, it will offer the period of greatest frequency. The general physiognomy of a child to assume this type of fever is suggestive of the many internal pangs through which it has passed; the child bears the marks of disturbed nutrition, the circulation is usually poor, hence the surface will be found cool, especially the hands and feet; the skin is dull, perhaps harsh and dry, probably earthy or yellowish. The child is more likely to be languid than irritable. The discoloration under the eyes is quite marked, pink in young children, darker in older. To this general physiognomy of a young child suffering from this predisposition, we often have superimposed, sudden, acute exacerbations due to some recent dietetic errors, or probably some emotional or climatic disturbances, according to the temperament of the individual, as illustrated in the following cases:

Case 1.—Harold, aged 6. An unusually healthy child of healthy parentage. Normal labor. Had for some days looked pale; appeared languid and constantly irritable; gastric irritation pronounced, associated with heavily furred tongue. One morning he ate a breakfast of heavy food very rapidly; at noon complained of headache, and during the evening was feverish, having a temperature of 102⅘ degrees. Following morning he seemed better, was cheerful and lively, attended school until noon. Toward evening, however, fever returned with temperature 102⅘ degrees again. The next morning temperature fell to 100. Complained of headache greater part of the day, though sponged two or three times. Fourth day, temperature 100 degrees, much more comfortable, no headache; temperature in the evening 102 degrees. Fifth day, severe headache early in the morning. Evening, temperature 100 degrees. Injection of glycerin and warm water, followed by a large bowel movement. Thorough irrigation with warm water and bicarbonate of soda removed a number of hard cheesy masses. Succeeding this the temperature was 99 degrees; much more comfortable. Evening temperature reached 102⅗ degrees. At this period he commenced to vomit. Seventh day temperature was normal; evening temperature was 101⅖ degrees. Eighth day the morning temperature was 99 degrees; evening temperature 102 degrees. Ninth day, morning temperature 99 degrees; noon temperature 102 degrees.

NURSE'S REPORT.

Nov. 30, 12 m. Temp. 105; pulse 130; resp. 24. 3 p.m. Temp. 105; pulse 128; resp. 24. 5 p.m. Temp. 104.3; pulse 124; resp. 24. 9 p.m. Temp. 104.3; pulse 120; resp. 24. 12 p.m. Temp. 103.3; pulse 124; sponge bath.

Dec. 1, 2 a.m. Temp. 104.3; pulse 124; resp. 26; sponge bath. 5 a.m. Temp. 103; pulse 112; resp. 24; slept about six hours; complained of headache. 7 a.m. Temp. 103.1; pulse 112; resp. 22. 8 a.m. Sponge bath; two bowel movements. 9 a.m. Temp. 103.3; pulse 118; resp. 22. 12 m. Temp. 104; pulse 120. 2 p.m. Temp. 105; pulse 126; resp. 28. 4 p.m. Temp. 104.3; pulse 120; resp. 24. 7 p.m. Temp. 105; pulse 124; sponge bath. 10 p.m. Temp. 105; pulse 124; resp. 24; sponge bath. 12 p.m. Temp. 104.3; pulse 120; resp. 24; sponge bath.

Dec. 2, 2 a.m. Temp. 103.3; pulse 126; resp. 24; sponge bath. 4 a.m. Temp. 104.3; pulse 124; resp. 24; sponge bath. 6 a.m. Temp. 104; pulse 124; resp. 26; sponge bath. 8 a.m. Temp. 104; pulse 124; resp. 26; sponge bath. 10 a.m. Temp. 104; pulse 116; resp. 24; sponge bath. Record of fifth day in bed: Complaint of headache, vomited twice, tongue heavily coated, three bowel movements, eleven sponge baths, patient sleepy and stupid most of the time. 12 m. Temp. 103; pulse 120; resp. 20; sponge bath. 4 p.m. Temp. 104.3; pulse 120; resp. 24; sponge bath. 6 p.m. Temp. 105; pulse 120; resp. 24. A general pack reduced temperature to 101. 8 p.m. Temp. 103; pulse 120; resp. 24. 10 p.m. Temp. 103; pulse 124; resp. 26. 12 p.m. Temp. 105; pulse 124; resp. 26; pack.

Dec. 3, 2 a.m. Temp. 102; pulse 112; resp. 28. 4 a.m. Temp. 104; pulse 122; resp. 30. 6 a.m. Temp. 102; pulse 122; resp. 30. 8 a.m. Temp. 103.3; pulse 124; resp. 30. Record of sixth day of patient in bed: In 24 hours, six sponge baths, two general packs, with continued abdominal pack; bowels distended; tongue heavily coated; bowel movements mixed with mucus; patient sleepy and stupid most of the time. 10 a.m. Temp. 102; pulse 112; resp. 20. 12 m. Temp. 104.3; pulse 116; resp. 20; pack. 2 p.m. Temp. 104; pulse 120; resp. 24. 4 p.m. Temp. 103.3; pulse 118; resp. 24. 6 p.m. Temp. 104.3; pulse 118; resp. 24; pack. 8 p.m. Temp. 102; pulse 114; resp. 24; 10 p.m. Temp. 103.3; pulse 114; resp. 20. 11 p.m. Temp. 103.3; pulse 118; resp. 20. 12 p.m. Temp. 104; pulse 124; resp. 24.

Dec. 4, 2 a.m. Temp. 104; pulse 120; resp. 28. 4 a.m. Temp. 103.2; pulse 118; resp. 28. 6 a.m. Temp. 103.2; pulse 118; resp. 26. 8 a.m. Temp. 103; pulse 116; resp. 24. Record of seventh day: In twenty-four hours four general packs, with abdominal pack; patient twitched all night and very stupid when aroused; bowels distended; tongue heavily coated, with red margin. 10 a.m. Temp. 103.3; pulse 118; resp. 28; 12 m. Temp. 103.2; pulse 118; resp. 28. 2 p.m. Temp. 104; pulse 120, resp. 28. 4 p.m. Temp. 105; pulse 120; resp. 28. 5 p.m. Temp. 102; pulse 120; resp. 28. 7 p.m. Temp. 104; pulse 120; resp. 28. 9 p.m. Temp. 103.1; pulse 120; resp. 24. 11 p.m. Temp. 103.4; pulse 120; resp. 28. 12 p.m. Temp. 105; pulse 124; resp. 28.

Dec. 5, 1 a.m. Temp. 103; pulse 120; resp. 26. 3 a.m. Temp. 104; pulse 120; resp. 24. 5 a.m. Temp. 103.3; pulse 120; resp. 24. 7 a.m. Temp. 103; pulse 118; resp. 22. 9 a.m. Temp. 104; pulse 114; resp. 20. Record of eighth day: Three movements of bowels; voided urine every four to six hours; abdominal pack; three general packs; still very stupid and twitched all night; bowels distended; heavy brown coated tongue, with red tip. 10 a.m. Temp. 103; pulse 112; resp. 20. 12 m. Temp. 103.1; pulse 120; resp. 20. 2 p.m. Temp. 103.1; pulse 124; resp. 20. 4 p.m. Temp. 104; pulse 124; resp. 20. 5 p.m. Temp. 101; pulse 126; resp. 24. 7 p.m. Temp. 103; pulse 124; resp. 24. 9 p.m. Temp. 103.2; pulse 120; resp. 24. 10 p.m. Temp. 103; pulse 108; resp. 20. 12 p.m. Temp. 103; pulse 108; resp. 24.

Dec. 6, 2 a.m. Temp. 102.3, pulse 110, resp. 20. 4 a.m. Temp. 103, pulse 114, resp. 24. 6 a.m. Temp. 103.3, pulse 118, resp. 24. 8 p.m. Temp. 103.1, pulse 116, resp. 24. Record of ninth day: Three bowel movements; voided urine; two general packs; abdominal packs renewed every two hours; twitched all night; slept well until 2 a.m.; very restless from 2 to 5; bowels distended; brown coated tongue with red tip. 10 a.m. Temp. 102.3, pulse 112, resp. 24. 12 m. Temp. 103, pulse 110, resp. 26. 2 p.m. Temp. 103.3; pulse 118; resp. 24. 4 p.m. Temp. 103.4; pulse 118; resp. 28. 6 p.m. Temp. 102.3; pulse 118; resp. 28. 10 p.m. Temp. 102.3; pulse 118; resp. 28. 12 p.m. Temp. 102.3; pulse 118; resp. 28.

Dec. 7, 2 a.m. Temp. 102, pulse 118, resp. 26. 4 a.m. Temp. 102.1, pulse 116, resp. 28. 6 a.m. Temp. 102.3, pulse 116, resp. 28. 8 a.m. Temp. 102.3, pulse 114, resp. 28. Record of tenth day: Two bowel movements; voids urine about every three hours; one general pack, with abdominal pack; still very stupid and sleepy and twitched all night; bowels less distended; tongue little better. 10 a.m. Temp. 101.3, pulse 108, resp. 24. 12 m. Temp. 101.2, pulse 108, resp. 26. 2 p.m. Temp. 101.3, pulse 110, resp. 24. 4 p.m. Temp. 101.4, pulse 108, resp. 24. 6 p.m. Temp. 101.4, pulse 108, resp. 24. 8 p.m. Temp. 101.4, pulse 108, resp. 28. 10 p.m. Temp. 101.2, pulse 110, resp. 28. 12 p.m. Temp. 101.1, pulse 108, resp. 26.

Dec. 8, 2 a.m. Temp. 101, pulse 108, resp. 28. 4 a.m. Temp. 101, pulse 108, resp. 26. 6 a.m. Temp. 101, pulse 106, resp. 26. 8 a.m. Temp. 100.2, pulse 100, resp. 26. 19 a.m. Temp.

99.3, pulse 90, resp. 24. 12 m. Temp. 99, pulse 90, resp. 24. Record of eleventh day of patient in bed: One bowel movement; discontinued abdominal pack; slept well; more rational when aroused; still twitches considerably; bowels less distended; tongue better, still red tip. 2 p.m. Temp. 99.3, pulse 90, resp. 24. 4 p.m. Temp. 99.3, pulse 90, resp. 24. 6 p.m. Temp. 101.1, pulse 86, resp. 26. 8 p.m. Temp. 100.2, pulse 90, resp. 24. 10 p.m. Temp. 100, pulse 84, resp. 54. 12 p.m. Temp. 100, pulse 84, resp. 24.

Dec. 9, 2 a.m. Temp. 99.3, pulse 84, resp. 29. 4. a.m. Temp. 99, pulse 86, resp. 29. 6 a.m. Temp. 98.3, pulse 84, resp. 29. 8 a.m. Temp. 99, pulse 90, resp. 29. Record of twelfth day: Bright and rational when aroused; ceased twitching about 1 a.m.; pulse drops beat every three or four beats; tongue still red tip; strychnin renewed, $\frac{1}{60}$ every fourth hour.

8 a.m. Temp. 99⅕, pulse 98, resp. 29. 12 m. Temp. 99⅕, pulse 98, resp. 29. 8 p.m. Temp. 99⅕, pulse 76, resp. 20. Record of day: Nourishment in twenty-four hours ℥xx; brandy ℥iii; pulse drops beat every three or four beats; patient very weak; quiet, rational; slept thirteen hours.

Dec. 10, 8 a.m. Temp. 99⅕, pulse 80, resp. 18. 12 m. Temp. 99, pulse 80, resp. 18. 8 p.m. Temp. 99⅕, pulse 76, resp. 18. Record of fourteenth day: Nourishment ℥xxii; brandy ℥iii; slept about fifteen hours; patient very weak; pulse drops three beats.

Dec. 11, 2 a.m. Temp. 76, pulse 99, resp. 18. 9 a.m. Temp. 76, pulse 99⅕, resp. 18. 12 m. Temp. 76, pulse 99, resp. 18. 8 p.m. Temp. 79, pulse 98, resp. 18. Record of fifteenth day: Nourishment ℥xxii; brandy ℥iiss; pulse drops every eight or nine beats; very restless part of night; slept fourteen hours.

Dec. 12, 1 a.m. Temp. 98⅖, pulse 78, resp. 20. 7 a.m. Temp. 98⅖, pulse 78, resp. 18. 1 p.m. Temp. 98⅖, pulse 70, resp. 18. 8 p.m. Temp. 98⅖, pulse 74, resp. 18. Record of sixteenth day: Nourishment ℥xxv; brandy ℥iiss; bowels constipated; urine ℥xl; slept fourteen hours; pulse drops every third beat; patient still very weak.

Dec. 13, 8 a.m. Temp. 98⅖, pulse 80, rep. 18. 1 p.m. Temp. 98⅖, pulse 84, resp. 18. 8 p.m. Temp. 98⅖, pulse 84, resp. 18. Record of seventeenth day: Nourishment ℥xxviii; brandy ℥iiss; bowels constipated; urine ℥l; pulse drops every ten beats; slept fourteen hours.

Dec. 14, 8 a.m. Temp. 98⅘, pulse 84, resp. 18. 12 m. Temp. 98⅖, pulse 84, resp. 18. 8 p.m. Temp. 98⅖, pulse 84, resp. 18. Nourishment in twenty-four hours ℥xxviii; brandy ℥iiss; one bowel movement; constipated; urine ℥xxxviii; slept fourteen hours out of twenty-four; was very restless part of night.

Dec. 15, 1 a.m. Temp. 98⅖, pulse 84, resp. 18. 8 a.m. Temp. 98, pulse 80, resp. 18. 1 p.m. Temp. 98⅖, pulse 84, resp. 18. Nourishment ℥xxviii; brandy ℥iiss; one bowel movement by enema; urine ℥xl; slept fourteen hours out of twenty-four; pulse drops every ten or eleven beats.

Dec. 16, 12 mid. Temp. 98, pulse 80, resp. 18. 8 a.m. Temp. 98, pulse 78, resp. 18. 12 m. Temp. 98.2, pulse 78, resp. 18. 8 p.m. Temp. 98.3, pulse 74, resp. 18. Slept fourteen hours.

Dec. 17, 1 a.m. Temp. 98, pulse 68, resp. 18. 8 a.m. Temp. 97, pulse 70, resp. 18. 12 m. Temp. 98.2, pulse 74, resp. 18. 8 p.m. Temp. 98.3, pulse 80, resp. 16. Slept fourteen hours; pulse drops every three to five beats.

Dec. 18, 8 a.m. Temp. 98, pulse 68, resp. 16. 12 m. Temp. 98.2, pulse 74. 8 p.m. Temp. 98.2, pulse 74. Slept thirteen hours; one bowel movement by enema.

Dec. 19, 8 a.m. Temp. 98, pulse 78, resp. 18. 12 m. Temp. 98.2, pulse 78, resp. 18. 8 p.m. Temp. 98.3, pulse 78, resp. 16. Slept fourteen hours.

Dec. 20, 8 a.m. Temp. 98.2, pulse 68, resp. 16. 12 m. Temp. 98.2, pulse 74, resp. 18. 8 p.m. Temp. 98.2, pulse 74, resp. 16. Slept thirteen hours.

Dec. 21, 8 a.m. Temp. 98.2, pulse 80, resp. 16. 12 m. Temp. 98.2, pulse 74, resp. 18. 8 p.m. Temp. 98.2. pulse 60, resp. 18. Slept about fourteen hours.

Dec. 22, 9 a.m. Temp. 98.2, pulse 68, resp. 16. 12 m. Temp. 98.3, pulse 70, resp. 16. 4 p.m. Temp. 99.2, pulse 80, resp. 16. 8 p.m. Temp. 99.3, pulse 80, resp. 16. Patient moved to another room which caused a rise in temperature.

Dec. 23, 8 a.m. Temp. 100, pulse 80, resp. 16. 1 p.m. Temp. 101.4, pulse 100, resp. 16. 8 p.m. Temp. 102.3, pulse 108, resp. 16. 12 p.m. Temp. 100, pulse 104, resp. 16. Slept sixteen hours.

Dec. 24, 8 a. m. Temp. 99.3, pulse 90, resp. 16. 12 m. Temp. 99.3, pulse 82, resp. 16. 8 p.m. Temp. 99.3, pulse 82, resp. 16. Slept sixteen hours.

Dec. 25, 8 a.m. Temp. 98, pulse 74, resp. 16. 1 p.m. Temp. 98, pulse 78, resp. 16. 8 p.m. Temp. 99, pulse 80, resp. 16. Slept fourteen hours.

Dec. 26, 8 a.m. Temp. 98, pulse 68, resp. 16. 1 p.m. Temp. 98.2, pulse 70, resp. 16. 8 p.m. Temp. 98.3, pulse 70, resp. 16. Slept fifteen hours.

Dec. 27, 8 a.m. Temp. 98, pulse 78, resp. 16. 1 p.m. Temp 98, pulse 78, resp. 16. 8 p.m. Temp. 98.1, pulse 78, resp. 16. Slept thirteen hours.

Dec. 28, 8 a.m. Temp. 98, pulse 78, resp. 16. 1 p.m. Temp. 98.3, pulse 80, resp. 16. 8 p.m. Temp. 98.2, pulse 78, resp. 16. Slept thirteen hours.

Dec. 29, 8 a.m. Temp. 99, pulse 82, resp. 16. 1 p.m. Temp. 99, pulse 82, resp. 16. 8 p.m. Temp. 90, pulse 80, resp. 14.

Dec. 30, 8 a.m. Temp. 98.2, pulse 80, resp. 14. 12 m. Temp. 98.2, pulse 80, resp. 14. 8 p.m. Temp. 98.5, pulse 80, resp. 14.

Dec. 31, 8 a.m. Temp. 98.2, pulse 78, resp. 14. 8 p.m. Temp. 98.1, pulse 78, resp. 14.

The case thus outlined ran forty-nine days of elevated temperature, associated with delirium, alternating with profound stupor; unconscious bowel movements; irregular heart action. The boy had nose-bleed, rose-colored spots, and assumed most strikingly the general physiognomy of typhoid fever. I believe that the prior-existing intestinal catarrh was provocative of an acute intestinal infection, producing a decided impression on the system, benumbing the reflexes and locally exciting an inflammation of the small bowel. He gave negative response to Widal's test.

In striking contrast to the above history of a prolonged auto-infection fever, permit me to briefly outline what I believe to be a case of typhoid fever in a child of one year.

Case 2.—A. B., 1 year old, breast-fed; an unusually well developed child, weighing at the time of the commencement of his illness about twenty pounds, having had none of the eruptive fevers, and but slight disturbance incident to the cutting of the six incisors. The general regimen of the child was up to this time unusually favorable. The family had recently moved into an old house where the plumbing was not up to the highest sanitary model. The child was apparently well up to the day of seizure. He was ill but a few hours. I found him with a temperature of 105 degrees; loose bowels; moderately distended abdomen; slow, irregular pulse; respiration quickened; general disinclination to be disturbed; photophobia. The fever sustained this height, varying from 104 degrees to 105⅕ for ten days, when it quickly, within twenty-four hours, reached the normal without any subsequent recurrence. The child, at the end of the second week, or four days after normal temperature had been reached, seemed perfectly well and happy. The blood gave a positive Widal test for typhoid. In this case we had vomiting, loose bowels, five to six per day, not necessarily offensive; evidence of imperfect digestion was present, but no masses were voided. We failed to find the rose-colored spots; the abdomen was soft and slightly painful; the spleen was undoubtedly enlarged; the tongue dry; no nose-bleeding. The case seemed to be more of the cerebral type, as the sphincters lost their control, yet we had no subsultus, and the case closely resembled a meningitis.

The diagnosis of the case rests on the continued fever, tympanitis, enlarged spleen, and last, and probably the most certain, the positive response of the Widal test. I admit the overwhelming difficulty surrounding a positive diagnosis of typhoid fever in so young a subject from malarial, influenzial fever, ileo-colitis, meningitis, or possible acute tuberculous, or auto-infective fever. From malarial fever we make the diagnosis by the absence of *plasmodium malarii*, and by the fact that I gave five grains of quinin per rectum for five days without any response in the temperature. The temperature curve was too uniform for malarial infection. From ileo-colitis the diagnosis was easy, as the child was supported on mother's milk drawn from the breast and administered by a spoon. While the case assumed a cerebral type, it was most evidently not one of meningitis. No irregular respirations. No constipation. The pulse was not in keeping with the respiration. No local paralysis. No retracted abdomen. The temperature was too high for meningitis. The unequal and irregular class of symptoms which go to make up a severe case of influenza in the very young afford the most probable pic-

ture to which we may refer this assemblage of symptoms; yet the Widal test should incline us to regard it as a true, uncomplicated case of typhoid fever. The urine in this case, while greatly reduced in quantity and containing an excess of urates and some oxalates, was free from indicanuria—a more positive evidence of auto-infection.

I have selected the two cases of fever in young children, because they both stand on debatable ground, yet both possessing strong evidence of correct diagnosis. The older child, with slow onset and general malaise, irregular type of fever followed by a most unusual form, gave strength to the assemblage of symptoms suggestive of true typhoid; yet, on closer scrutiny, they would negative this opinion, especially with a more conclusive test of Widal's reaction, ruling it out of this category.

The second case, the young child of one year, with an assemblage of symptoms wholly unlike the unusual symptoms of typhoid, was undoubtedly a genuine one, not only by reason of exposure, but by the positive reaction test and the absence of indicanuria.

The whole subject of auto-intoxication, as found in young subjects, is exceedingly fascinating as possessing such a kaleidoscope of passing, changing symptoms as to bewilder the investigator. It has passed through many changes of meaning since its recognition. Auto-intoxication through the intestinal canal consists of retention of the usual abnormal material in the bowels. The result of this retention is decomposition, putrefaction and fermentation of the waste part of the food, giving us formic, buteric and lactic acid, and a generous amount of offensive gases pressing on the intestinal filaments of the pneumogastric and other nerves, giving rise to many local and general symptoms. The decomposition of albuminous products gives rise to the formation of phenol, indol, skatal and tyrosin. With knowledge of these many products of imperfect assimilation in the intestinal tube, a varied train of symptoms must necessarily arise, suggesting directly a disorder of the bowels themselves and reflexly of the respiratory system as seen in reflex bronchitis, nervous cough, local and general convulsions. The circulation is positively disturbed, oftimes profoundly influenced, producing tachycardia, cold hands and feet, livid lips, blue eyelids, erythema fugax, and perspiring head and limbs. The kidney may assume an effort to dislodge the intruder, as found in lithemic urine, excessive uric acid and indicanuria. This long line of symptoms may be greatly enlarged, according to the personal equation of the investigator and the child's environments. We possess one positive proof that they are actually associated with the poison retained in the intestinal tube, because the symptoms disappear when the fermenting masses are removed.

That form of auto-intoxication found in adults, characterized by depressed spirits, disgust for all exertion, retiring disposition bordering on melancholia—the pessimistic individual—has its parallel in the young child in feverishness, fretfulness, destructiveness, nameless crying, aversion, and unusual perversion of the childish state.

Indicanuria I have found nearly always suggestive of auto-intoxication in young children and precedes the more serious symptoms by many days. This condition of the urine has not received the careful study it merits. Constipation is not always associated with auto-intoxication, as we might first imagine.

Oftimes the more fluid the intestinal movements are the more rapid may be the absorption of the poisonous material. In these cases the urine is highly noxious, and a good example of this diarrheal form of auto-intoxication is seen in cholera. However, in cholera the absorption of toxins seems to be continuous, while we may have frequent colliquative evacuations. The convulsions in young children suffering from gastro-intestinal disturbances may be explained better in terms of auto-intoxication than by the usual reflex theory or the undeveloped cortex.

SUBNORMAL TEMPERATURE IN TYPHOID FEVER.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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The vagaries of the temperature history of typhoid fever are familiar to us all. While the mass of recorded temperature shows a certain regularity extending over a period of nearly three weeks, in historic or average cases; yet our experience brings to our knowledge a series of cases at variance with the classic course. These differences exist in cases gathered when happening in either childhood or adult life. While in adult life we can with certainty prognose the febrile history in an average case, in childhood this is more difficult, as the vagaries of temperature are so elusive that many days may elapse before the true condition can be determined. The degree of temperature is of different significance in childhood and adult life—what would be considered a dangerously high temperature in the adult would not carry the same import in the child. Why this should be so, would seem to me to be due to the greater resistance of the adult against febrile disturbances due to septic influences.

Why do our cases often present subnormal temperatures? is the subject upon which I would want the gentlemen to throw some light. I have seen several instances of this phenomenon, but none in which this symptom was so marked and in which it persisted so long as in the case of a young boy whose history I will relate.

The patient was 9 years old, healthy, well-proportioned, and had complained for several weeks before medical advice was sought. When first seen, he had probably advanced well on to the second week of typhoid, with roseola well marked. At the beginning of the third week, the temperature dropped as low as 96.4 degrees, axillary and *per orem*. For eight days the temperature persistently remained about this degree. During this time the patient was otherwise doing well; skin cool and dry; intellect good; urination good; bowels opened each day, presenting nothing unusual; no evidences of internal hemorrhage. Patient felt well, did not complain of any unusual aberrations; finally, on the eighth day, we were enabled to record a natural temperature. This long-continuance was a source of great anxiety to all concerned, yet despite all our efforts to restore the normal condition, no means seem to have been of the least avail.

An Encouragement.—In the United States 70,000,000 gallons less of alcohol were consumed in 1896 than in 1888.

OBSERVATIONS IN DIPHTHERIA.

Presented to the Section on Diseases of Children at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY H. D. JEROWITZ, M.D.

KANSAS CITY, MO.

It is not the purpose of this paper to lecture upon diphtheria and its treatment before this assembly of eminent physicians nor to enter into any detailed bacteriologic study which would perhaps be only an incomplete reiteration of principles thoroughly known, discovered and taught by some of the other members present; but merely to base my remarks upon conclusions drawn from an impartial observation covering an experience of seven years, which, as has been my good fortune, has been much larger than one would naturally expect for that short space of time. As to conclusions, it must be remembered that experiences vary with different observers; depending 1, upon the virulence of the epidemic, and 2, upon the mode of treatment. A third item may also be mentioned, as it plays an important rôle in deductions made in this article, and that is the susceptibility and resisting powers of certain classes or sects of people.

From this it is evident that unless the observation includes all the different sects and all kinds of epidemics, statistics would not be reliable. Such an extensive experience, however, could not be expected from a general practitioner in a town of 150,000 inhabitants, having no children's hospital or any other opportunity of studying the cases, except as they occur in private practice. The observations include several hundred cases of "exudative" or "membranous" angina, having the diphtheria bacillus. The majority of these cases were comparatively mild and some could not be distinguished from an ordinary sore throat with either a punctate or a coalescent exudation. A certain number (about 8 per cent.) were followed by paralysis and some had laryngeal involvement (about 4 per cent.). For a long time I was reluctant to call these cases diphtheria, as they did not appear serious enough.

It seems that the ancient diphtheria described in text-books and the modern diphtheria, having as its principal diagnostic point the presence of the Klebs-Loeffler bacillus without regard for the clinical appearance, are two different things. The books describe diphtheria as a severe sickness with profound septic poisoning, a depressed heart and a rapid tendency to cardiac failure, the latter being the chief cause of death, and occurring often inside of twenty-four hours. The patient is said to present an anemic appearance and the fever is not high. The membrane upon which they dwell a good deal is said to be gray and *within* the mucous membrane, not a superficial exudation. It is not detachable, as it is really the mucous membrane itself, whose only possible way of removal is sloughing off, leaving a raw ulcerated surface which has to heal. The glands of the neck are enlarged, which is also considered a constant symptom. The mortality is given all the way from 50 to 100 per cent., and some physicians even today believe that when a case recovers it was not diphtheria.

The modern diphtheria of today is any sore throat, even without exudation, which will give a culture of the Klebs-Loeffler bacillus. The child may apparently be well and play; there need be no cervical enlargement, no dirty membrane which is undetachable; the principal thing is the germ. In some of these cases there is a decomposition going on in the throat with septic infection and usually a fatal result. It is evidently the fact that formerly only these septic cases were considered diphtheria; hence, the great rate of mortality. But now, when the diagnosis is made so much oftener, I find that diphtheria is not such a dreadful disease as generally supposed, and whose danger is, like in measles, scarlet fever, etc., principally from the complications.

The most important of these are involvement of the deeper respiratory passages, nephritis with uremic poisoning, septic infection, and sudden cardiac paralysis. The clinical picture is about as follows: Sudden onset with high fever, chilliness, and general malaise; sometimes vomiting and occasionally convulsions. Very often the throat is not complained of and a diagnosis can easily be overlooked, until the condition becomes serious. Such cases as these, if resulting fatally, unnecessarily increase the mortality rate; hence it should be the rule of every physician who has been called in to see a sick child to examine the throat, even though he be positive of its uselessness. On examining the fauces we find a white or yellowish patch on one or both tonsils, extending sometimes to the posterior wall of the pharynx and uvula, and even further. This exudation can in a great many cases be removed, but it will soon reappear. If left alone it will disappear in from ten to fourteen days—sometimes longer. It does not slough off, in some cases it simply loosens and is spit up, while in cases where it is more adherent it seems to become absorbed, getting thinner and thinner until it finally disappears, leaving a healthy mucous surface, which in some cases may appear slightly congested, but not raw.

When the lower air passages become involved, unless the trouble begins there, the attack is usually sudden and entirely distinct from the pharynx. It does not extend from the latter to the larynx, but *is a separate process*. It is recognized by the hoarse and croupy cough, and the stridulous respiration.

Uremic symptoms occurred in about 5 per cent. of the cases, and these would invariably have paralysis. Albumin was rarely found, being absent in many cases having uremic symptoms. The paralysis involved principally the muscles of the throat. In three cases it affected the ciliary muscle of the eye, having the same effect as if a mydriatic had been employed. In one case it involved the left arm; in one both lower extremities; in two the muscles of the back and the back of the neck, which resulted in a drooping of the head; in one beginning with the muscles of the throat, extending to the extremities, then to the muscles of the chest and finally the heart; and in still another, now under observation, the paralysis involves the sphincters of the bladder and anus and the muscles of the left hip and leg. With the exception of the one fatal case and the one now under observation, the paralysis disappeared, varying in its course from one week to three months.

The number of deaths was seven. This is about $1\frac{3}{4}$ per cent. A brief description of each would perhaps be of interest.

Case 1.—Female child, age $3\frac{1}{2}$ years. Had been sick for a week before medical aid was received. Pharynx, larynx and trachea involved. Tracheotomy was advised but refused until the patient was almost exhausted. It was then performed, but patient died next day from exhaustion. No antitoxin used.

Case 2.—Male child, age $3\frac{1}{2}$ years. Began slightly on tonsils, but child played on the street right along, and soon

became croupy, and was so for three days before I was called. Finding just a small speck of exudation on one tonsil, and having treated the other children of the family that week for a mild diphtheria, I warned the mother of the seriousness of the case; but she said the child always was croupy whenever he took cold, and disregarded the advice. The next morning the condition became worse, the breathing very stridulous and difficult and the lips cyanotic. After an unsuccessful attempt at intubation, tracheotomy was performed and the child at once improved. The membrane involved the wound and twelve days afterward the child died at night from neglect by allowing the tube to get plugged up. No antitoxin was used.

Case 3.—Female child 3½ years old. Took suddenly sick with laryngitis one day, and the next day the obstruction was so complete that the child was apparently dead, when intubation was attempted, but as it was not considered safe with this, tracheotomy was resorted to. Then with artificial respiration and application of heat to the body, the child rallied after about five hours and was able to sit up and drink. The following morning the child died of neglect, the inner tube having been laid on a table by the attendant and forgotten to be replaced, so that when the child was beginning to suffocate, the attendant in trying to remove the inner tube (which was not there) lost so much time by thinking it was caught in some way, that the child succumbed. In this case no membrane was visible and no antitoxin was used.

Cases 4 and 5.—These two cases were one male and one female, age 3½ years, who had septic infection and laryngeal involvement. Antitoxin was used too late and shortly before death tracheotomy was performed, which relieved the dyspnea for an hour, when they succumbed to cardiac weakness dependent on the septicemia.

Case 6.—Female child 3½ years old. Had, together with the other children of the family, tonsillar diphtheria, which disappeared in about three or four days in all of them. But in this one about three days afterward, fever developed, and a slight patch reappeared on the tonsils. When the child cried there seemed to be a stridulous or sawing noise which led to an examination of the lungs. There were subcrepitant râles showing that the lungs must have been involved. There was no cough nor hoarseness. The child was apparently well, and when asleep there was not the slightest noise with the respirations. Only when the child cried could this peculiar sound be heard. This child lived another week after this, dying from slow carbonic acid poisoning, as was noticed by the gradually increasing cyanotic appearance. No antitoxin was used.

Case 7.—This case was a tonsillar diphtheria of one side. The membrane disappeared in five days by gradual absorption: then came uremia and paralysis. The urine was full of albumin, dropsy developed, and the paralysis increased until it involved almost the entire body. Soon the albumin and dropsy disappeared, the paralysis became somewhat better, the child sat up, and in reaching for something, sudden death occurred. This was about six weeks from the beginning of the illness. No antitoxin had been used.

In summing up these cases, No. 1 might have been saved with antitoxin, if used early enough. No. 2 died of neglect, but antitoxin would have prevented the operation. No. 3 had no visible membrane, and died of neglect. Nos. 4 and 5 could not have been saved. No. 6 could have been saved with antitoxin if it had been used in the first attack. No. 7 might have been saved by antitoxin, but as the exudation was of short duration, and the general symptoms mild, it is a question.

Thus, out of the seven fatal cases, only three could be really attributed to the disease. This would make a mortality of three-fourths per cent.

TREATMENT.

As to the treatment, I only wish to mention a few points. It is useless to detach the membrane, for two reasons: First, it quickly reappears, thus giving it new activity and prolonging the disease. Second, by forcibly detaching, the surface is abraded, and septic infection easily follows. I dare say that if you leave the membrane alone in all cases, you will have less septicemia and less deaths. Gargles or sprays should be mild, antiseptic, and often. When not practicable, antiseptics such as listerin, hydrogen peroxid, etc., can be administered internally. Whisky for stimulation. Plenty of water in all cases, and calomel when indicated, especially in uremia. Iron I never employ, as by its astringent and cauterizing properties it can only interfere with natural drainage and healthy excretion. With this treatment, the disease can not be cut short, nor does it prevent its extension. For this we must employ antitoxin.

ANTITOXIN.

As to the use of this agent, I can give you my observations from an impartial standpoint. The first thing noticed after using antitoxin is a reaction, an immediate effect, something that we do not observe after other remedies unless we give full doses. It is therefore evident that the antitoxin is a powerful agent, and certainly produces some change in the system.

The second thing noticed is that in every case where I administered antitoxin in the proper dose, the membrane disappeared inside of three days. Without its use, while I have seen cases get well in the same length of time, yet the majority of cases lasted from ten to fourteen days. Third, in all cases where I employed antitoxin in the beginning the larynx did not become involved, and uremia did not occur, while in cases treated without antitoxin the larynx became involved frequently, and uremia also followed. Fourth, in cases where the membrane involves the larynx, trachea, and even the bronchial tubes, recovery followed when treated with antitoxin while the same class of cases before the use of antitoxin always died. Fifth, neglected cases, complicated with septicemia and laryngeal involvement, do not recover with any treatment. Sixth, in severe cases of dyspnea, with occasional cyanosis, the use of antitoxin and emetics has obviated the necessity for tracheotomy. Seventh measles as a complication is no bar to the use of antitoxin. Eighth, in laryngeal cases complicated with uremia or nephritis antitoxin was followed by favorable results, thus proving that uremia and nephritis are not necessarily contra-indications to the use of antitoxin. Ninth, as paralysis was seen to follow only the cases of long duration, those in which antitoxin was administered early were not followed by paralysis. Of those in which it was given on the second or third day it followed in about 8 per cent. of the cases. From this it follows that antitoxin does not prevent paralysis except indirectly by cutting short the disease. Tenth, place of injection, behind scapula. No abscess or other bad result followed.

INTUBATION.

This has been resorted to in extreme cases. Some cases were rendered worse, and were at once followed by tracheotomy. Some were only slightly improved, and in these the tube was removed and the patient carefully watched, so that tracheotomy could be performed immediately upon indication therefor, but the severe attacks of suffocation were only transient, and surgical intervention became unnecessary.

TRACHEOTOMY.

This was performed five times, all proving fatal. Two of them died of neglect, two of them had profound septicemia at time of operation, and were only temporarily improved so far as respiration was concerned, and one was already exhausted from suffocation, owing to procrastination on the part of the parents. The operation was always done without an anesthetic. There were a great many other cases that

seemed to indicate tracheotomy and looked as if they could not live more than an hour or two, yet they recovered without the operation. Therefore I think that cases recovering from an early tracheotomy would have done so without it. In cases dying from slow carbon dioxid poisoning from membranous bronchitis or membranous pneumonia, I did not perform tracheotomy, as it seemed to me useless.

Let us summarize a few points:

1. The majority of cases are mild, and affect only the tonsils and pharynx.

2. The exudation lasts from one to two weeks. There are exceptions to this.

3. Removal of the membrane is useless, as by denuding the surface septic infection is promoted, and besides, the membrane soon reappears and remains longer than if it had not been meddled with.

4. The involvement of the larynx is always sudden and comes as a new attack, and not by extension of the diphtheritic process.

5. The larynx becomes involved in about 4 per cent. of the cases.

6. Every case complicated with uremia had post-diphtheritic paralysis.

7. Laryngeal involvement is to be most dreaded between the ages of 3 and 5.

8. Intubation and tracheotomy will become less and less necessary as the value of antitoxin is being recognized.

9. Conclusions as to antitoxin have been given above.

INDICATIONS FOR INTUBATION.

Presented to the Section on Diseases of Children at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY H. M. McCLANAHAN, M.D.

OMAHA, NEB.

The conclusions deduced from a study of the symptoms of laryngeal diphtheria, as stated in this paper, are the result of personal observations at the bedside. My sole object in presenting them to the distinguished members of this Section is to elicit their candid criticisms, that, profiting by their large experience, I may be the better qualified to decide when to act, when to defer and when to desist.

When called into the presence of a little patient suffering from laryngeal diphtheria, the decision of the question whether to intubate or not is a very grave one, and we can only rightly measure our responsibility when we realize that a human life may be sacrificed by an erroneous decision. Aside from the symptoms, our decision will be modified by two circumstances, namely: the previous treatment and the environment of the patient. Before the discovery of antitoxin, the majority of cases of laryngeal diphtheria became urgent enough to demand intubation for their relief. Under the influence of this remedy 60 per cent. recover without mechanical aid. It will be apparent then that in a given case our decision will be modified by the fact whether antitoxin has been previously administered. We may defer operation in a case already under the influence of this remedy, whereas in another case presenting identical symptoms we would feel warranted in intubating at once, because twelve to twenty-four hours must elapse before amelioration of symptoms can be expected. In hospital practice, with a resident physician constantly at hand and competent to operate, surgical interference may be deferred for immediate urgent symptoms, knowing that the relief of the stenosis can be procured in a few moments. In private practice, where a delay of hours might easily occur before the physician could return to the patient, greater caution is necessary. My conclusions are deduced from cases in family practice, and it is from that standpoint that I wish to discuss the subject.

Let us briefly note the symptoms that indicate the necessity for intubation:

The character of the respiration.—Labored inspiration is a constant symptom in all varieties and degrees of laryngeal stenosis. The importance of this symptom depends upon the amount of muscular effort expended in pumping air into the lungs. There is no way of measuring this expenditure of vital force more certainly and accurately than by observing the extent of the epigastric recession with each inspiration. Where there is noticed a deep depression, we may be certain that the patient is in a critical condition, and we have no assurance as to how long he may be able to continue this effort. Intubation here meets two important indications: More oxygen is received into the lungs, and violent muscular effort is suspended, increasing the vitality and saving the strength of the patient. Labored expiration is an important symptom; to my mind, the most important evidence of a pseudo membrane in the larynx. While this is usually associated with labored inspiration and other symptoms, the two are not always in proportion; for example, in one case each expiratory effort was prolonged and labored, with a pause at the end of the inspiratory act, but inspiration was comparatively easy, with but slight epigastric recession, yet this patient was both cyanotic and extremely restless. Intubation restored the rhythm of the respiratory act with prompt relief of the cyanosis.

The number of respirations per minute.—This is important, as indicating the extent of involvement of the respiratory tract. In laryngeal diphtheria my observation has been that the respirations are not greatly accelerated, whereas if there be involvement of the lesser tubes and air vesicles, we find both labored and rapid respirations. This class of cases present the most unfavorable prognosis, not so much on account of the laryngeal stenosis as of the septic pneumonia complicating the case. While in these cases intubation will relieve the labored respiratory act, it does not lessen the frequency of the respirations. I believe, however, the operation is indicated, not only to relieve the stenosis, but to enable the child to cough more vigorously, and more effectually to clear out the lesser bronchial tubes. In two cases where the symptoms were not extremely urgent there were attacks of dyspnea, due to spasm of the muscles of the larynx, presenting a typic picture of spasmodic croup. Both became markedly cyanotic during the attack. There was no evidence that this was due to particles of loosened membrane, and I am satisfied from the study of the cases that it was a spasmodic condition complicating the true croup. This complication adds greatly to the suffering of the patient and the anxiety of the friends. The history of such attacks, coming on at irregular intervals, in a case where the other symptoms are not extremely urgent in the interim, in my experience, demands intubation. In the two cases of this type—while I do not affirm that they would have terminated fatally—I do

say that, as the result of intubation, they recovered more comfortably.

Extreme restlessness.—This is an important symptom. When a child is continually changing its position and tossing about from side to side, we may feel certain that it is in a dangerous condition. While this symptom is usually associated with the other symptoms, especially that of epigastric recession, I have seen cases where this was by far the most prominent feature. Indeed, in two cases, but for the restlessness, the patient would not have been thought in immediate danger. I am satisfied this restlessness is due to a lack of oxygen, and is dangerous not only for this reason, but also because the patient rapidly wears itself out by its exertions. When, therefore, extreme restlessness is a marked symptom, even if the other symptoms do not appear urgent, it demands intubation for its relief. The relief given in these cases is usually very prompt.

Cyanosis.—When not due to a spasmodic condition or loosened membrane cyanosis is usually a late symptom, and a very serious one. We sometimes notice this symptom where the others are not prominent, but as far as I have observed, it has been preceded by the other symptoms mentioned. I am satisfied that many cases of this type are not cyanotic so much on account of the laryngeal stenosis as because of obstruction in the deeper portions of the respiratory tract, and I think this explains why it is that intubation often fails to give complete relief. The operation is indicated, however, to relieve the stenosis and to enable the child to cough and more effectually clear out the deeper portions.

From this brief study I will draw the following conclusions: The majority of cases recognized early are amenable to treatment by antitoxin. A certain number, however, fail to respond to the remedy. In these cases, if at the end of twenty-four hours a study of the symptoms leads us to the conclusion that the patient is not better, then intubation should be done. In all cases presenting any one of the following symptoms prominently, namely: deep epigastric recession with each inspiration, labored and prolonged expiration, extreme restlessness, spasmodic attacks coming on at intervals, or persistent cyanosis, then intubation should be performed. I am satisfied that in our enthusiastic confidence in antitoxin, we often expect too much from the remedy, and that in cases seen late it would be wise to intubate and administer this remedy rather than give the remedy and wait for its effect. Antitoxin and intubation are in no way antagonistic. Intubation is the complement of antitoxin, to be used only where indicated, and when indicated it is generally a life-saving operation.

INTUBATIONS FOR DIPHTHERITIC CROUP.

A REPORT OF THIRTY-EIGHT CONSECUTIVE CASES WITH THIRTY-SIX RECOVERIES. ALL TREATED WITH ANTITOXIN.

Presented to the Section on Diseases of Children at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY F. E. WAXHAM, M.D.

Professor of Diseases of the Chest, and Laryngology, Chicago Clinical School.

CHICAGO, ILL.

Desiring to add my testimony to that of many others regarding the value of one of the greatest remedies of the century, I beg leave to place the following cases on record. These cases were no less severe nor less dangerous than those operated upon before the days of antitoxin, and the great reduction in mortality can not be attributed to a milder type of the disease.

June 30, 1895, through the courtesy of Dr. L. T. Durbin, I was called to operate upon a boy of 3 years. The tube was worn six days, being coughed out once, but returning dyspnea required its reintroduction. Antitoxin used; bacteriologic examination positive; recovery slow, but complete.

Sept. 2, 1895. Dr. Wm. P. Munn called upon me to intubate a child 2½ years old. The patient was nearly dead from asphyxation. Antitoxin given; tube ejected several times from exfoliation of membrane below the tube; bacteriologic examination positive; uneventful recovery.

Oct. 6, 1895, I was called by Dr. A. M. Bucknum. The patient was 2½ years old. Antitoxin given; child greatly exhausted from difficult breathing; examination positive; good recovery; tube was worn five days.

Oct. 16, 1895. Dr. J. W. Hawk called me to operate upon a boy 3 years old. Patient greatly exhausted; removed tube on third day, but it became necessary to reintroduce it. The tube was permanently removed on the ninth day; examination positive; antitoxin used; good recovery.

Oct. 23, 1895. Courtesy of Dr. David Thompson. Patient 2 years old; very unfavorable case; nasal cavities, pharynx and larynx involved and the child nearly dead from asphyxia. Antitoxin given and intubation performed; examination positive; tube worn five days; perfect recovery.

Oct. 23, 1895. Courtesy of Dr. C. B. Richmond. Patient 3 years old; pharyngeal and laryngeal diphtheria. Antitoxin given; intubation performed; examination positive; tube worn five days; recovery.

Aug. 6, 1896. Courtesy of Dr. Hugo Mager. Examination positive; antitoxin; recovery; tube worn four days; age 6 years.

Sept. 13, 1896. Courtesy of Dr. P. V. Carlin. Examination positive; antitoxin; recovery; tube worn four days; age 16 months.

Nov. 8, 1896. Courtesy of Dr. Charles Jaeger. Examination positive; antitoxin; recovery; tube worn five days; age 4 years.

Dec. 2, 1896. Courtesy of Dr. Catherine Hayden. Examination positive; antitoxin; recovery; tube worn five days; age 2½ years.

Dec. 31, 1896. Courtesy of Dr. George Packard. Antitoxin; recovery; wore tube four days; age 3 years.

Jan. 12, 1897. Courtesy of Dr. L. E. Lemen. The patient had been sick with croup for three days before the doctor was called; membrane had already invaded the bronchi. Intubation done at once and antitoxin given; examination positive. Tracheotomy became necessary twenty-four hours after intubation on account of membrane in lower trachea and larger bronchi. Death occurred within twelve hours, from bronchial obstruction. Age 4 years. In the light of our present knowledge we should have given antitoxin in double the strength and repeated it more frequently.

Jan. 22, 1897. Courtesy of Dr. Herrick. Examination positive; antitoxin; recovery; tube worn two days; age 3 years.

April 7, 1897. Courtesy of Dr. P. V. Carlin. Positive; antitoxin; recovery; age 2½ years; tube worn four days.

Aug. 14, 1897. Courtesy of Dr. F. E. Warren. Positive; antitoxin; recovery; age 4 years; tube worn five days.

Sept. 30, 1897. Courtesy of Dr. H. L. Taylor. Positive; antitoxin; recovery; age 4 years; tube worn five days.

Oct. 16, 1897. Courtesy of Dr. D. R. Lucy. Positive; antitoxin; recovery; age 2 years; wore tube six days.

Oct. 31, 1897. Courtesy of Dr. P. V. Carlin. Positive; antitoxin; death occurred from broncho-pneumonia thirty-six hours after the operation. Age 16 months; surroundings very unfavorable, people living in a shack of two rooms.

Oct. 31, 1897. Courtesy of Dr. Von der Smith. Positive; antitoxin; recovery; expelled tube on the third day; age 4 years.

Nov. 7, 1897. Courtesy of Dr. Leavitt. Positive; antitoxin; recovery; wore tube five days; age 3 years.

Nov. 23, 1897. Courtesy of Drs. H. B. Whitney and H. C. Snitcher. Positive; antitoxin; recovery; wore tube five days; age 5 years.

Nov. 26, 1897. Courtesy of Dr. David Thompson. Positive; antitoxin; recovery; tube worn five and a half days; age 4 years.

Nov. 30, 1897. Courtesy of Drs. Worthington and Munn.

Positive; antitoxin; recovery; wore tube seven days; age 5 years.

Dec. 13, 1897. Courtesy of Dr. A. K. Worthington. Positive; antitoxin; recovery; age 2½ years; wore tube six days.

Dec. 14, 1897. Courtesy of Dr. H. C. Snitcher. Positive; antitoxin; recovery; age 13 months; wore tube nine days. This was the fourth case of diphtheria in the family, and the second one operated upon.

Dec. 21, 1897. Courtesy of Dr. Frank Dulin. Positive; antitoxin; recovery; age 6 years; wore tube five days.

Dec. 30, 1897. Courtesy of Dr. C. P. Perry. Positive; antitoxin; recovery; age 2 years; expelled tube on fifth day.

Jan. 1, 1898. Courtesy of Drs. McLaughlin and Weaver. Positive; antitoxin; recovery; expelled tube on fourth day; age 6 years.

Jan. 15, 1898. Courtesy of Dr. J. S. Neva. Positive; antitoxin; recovery; age 6 years; tube worn five days.

Jan. 31, 1898. Courtesy of Dr. P. V. Carlin. Positive; antitoxin; recovery; age 2½ years. Tube removed on fifth day.

Feb. 3, 1898. Courtesy of Dr. P. V. Carlin. Positive; antitoxin; recovery; age 6 years; removed tube on fourth day.

Feb. 15, 1898. Courtesy of Dr. P. V. Carlin. Positive; antitoxin; recovery; age 8 years; removed tube on fourth day.

Feb. 20, 1898. Courtesy of Dr. D. R. Lucy. Positive; antitoxin; recovery; age 2 years; removed tube on sixth day.

Mar. 3, 1898. Courtesy of Dr. I. B. Perkins. Age 17 months; positive; antitoxin, five doses, each 1000 units; recovery; removed tube on fifth day.

Apr. 27, 1898. Courtesy of Dr. T. J. Carlin. Positive; anti toxin; recovery; removed tube on fifth day; age 2 years.

May 11, 1898. Courtesy of Drs. Ellsner and Gorsuch. Positive; antitoxin; recovery; removed tube on fifth day; age 6 years.

May 12, 1898. Courtesies of Drs. Warren and Worthington. Positive; recovery; removed tube on sixth day; age 2 years.

May 24, 1898. Courtesy of Dr. P. V. Carlin. Positive; antitoxin; recovery; tube ejected two days after introduction; age 20 months.

In this connection I would allude to an adult, 40 years of age, with diphtheritic croup, to whom I was called in consultation with Dr. W. E. Shotwell. The patient expelled a membranous cast of the trachea and recovered under repeated doses of antitoxin without an operation. Recovery was formerly so very rare in the adult, that I believe this case is worth recording. I should also call attention to a case to which I was called by Dr. P. V. Carlin, March 1, 1898, and which has been excluded from this report, as the patient was moribund and died during the operation, and could not be resuscitated, although tracheotomy was also performed. This is the only case that has been excluded.

To recapitulate: of the thirty-eight cases operated upon, five were under 2 years of age with four recoveries, or 80 per cent.; eleven were 2 years old, with eleven recoveries, or 100 per cent.; six were 3 years old, with six recoveries, or 100 per cent.; seven were 4 years old, with six recoveries, or 85.7 per cent.; two were 5 years old, with two recoveries, or 100 per cent.; six were 6 years old, with six recoveries, or 100 per cent., and one 8 years old, with one recovery, or 100 per cent.; total, thirty-eight cases, with thirty-six recoveries, or 94.7 per cent.—a mortality of only 5.3 per cent. in a class of cases that formerly was dreaded above all others.

A few years since it was my experience, out of several hundreds of operations to have saved 35 per cent. Why this great reduction in mortality from 65 per cent. to 5.3 per cent.? There is but one answer. It has been due to the use of antitoxin. If my experience stood alone the conclusion might well be doubted, but inasmuch as the great reduction in mortality has been noted by all operators, it must be conceded to be correct. In former years patients died, in the great majority of cases, after intubation or tracheotomy, from the extension of the diphtheritic exudate into the bronchi. At present this rarely occurs. I am fully convinced that when antitoxin is properly and energetically employed in full doses and repeated, the disease is at once cut short and no further progress occurs. I am also convinced that if a patient dies after intubation from bronchial obstruction due to the presence of diphtheritic exudation, the remedy has either been used late, the extension having taken place before its administration, or it has been used with a hesitating hand and in insufficient dosage, or the preparation has been of uncertain strength. When a child is taken ill with diphtheritic or membranous croup—which I consider identical—the danger is so great that hesitation in the heroic use of antitoxin is almost criminal. I certainly should advise a full dose of 2000 units even for a child, and half the strength for infants, repeating the dose in twelve or sixteen hours. In one of the cases reported, four doses of 1000 units were given an infant 13 months old, and in another 17 months old, five doses of 1000 units without any injurious effect.

Even at this late day we occasionally meet with those who still cling to former methods of treatment, hoping to carry their patients through without subjecting them to the dangers (?) of antitoxin, and who are apparently afraid of the remedy and hesitate about repeating the dosage. I would again and again repeat and emphasize the fact that antitoxin *must* be given early. It *must* be given in full doses and repeated once, twice or thrice, if necessary. My confidence in antitoxin is so great that I sincerely believe that with intubation, aided by the proper and free use of this remedy, death from diphtheritic croup should rarely occur.

DIPHTHERIA AS VIEWED BY THE GENERAL PRACTITIONER DURING THE LAST YEAR.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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CAMDEN, N. J.

It is not my aim to present a learned dissertation either on the pathology or scientific treatment of diphtheria. These subjects have been before the profession so constantly during the last three years that such a paper would prove only an intrusion upon your valuable time. What I wish to do is simply to make a few practical observations that must be patent to every general practitioner. Until recently diphtheria ranked as the gravest of the anginas, and the most dreaded of the acute febrile affections. This applies with especial emphasis to the laryngeal types, formerly largely regarded as a distinct disease, but now generally recognized as identical with diphtheria of the larynx and properly treated with heroic doses of antitoxin. Yet the nasal and naso-pharyngeal types with their preponderance of constitutional manifestations and former frightful mortality were scarcely less dreaded both by the physician and parent.

Recent advances in diagnosis and treatment, it seems to me, have left scarlet fever at the head of the anginas and typhoid at the head of the acute fevers in point of morbid possibilities. Even the progress which has been made in diagnosis is to be credited to antitoxin, it being due to the new impulses contributed by serum therapy. In the American Pediatric Society's report on the collective investigations of the

antitoxin treatment of laryngeal diphtheria in private practice, this advance is admirably noted in the following words: "In the early days of intubation it was customary to speak of the percentage of recoveries, and 24 to 27 per cent. were considered good result. In the last report the recoveries had crept up so high in the one hundred cases that it seemed more natural to speak of the percentage of mortality"; and again, in speaking of O'Dwyer's personal experience prior to the introduction of antitoxin, in nearly five hundred operative cases of laryngeal diphtheria in which the mortality rate was 72.44 per cent.: "When he had reached the seventieth case on the fifth hundred something occurred which carried the phraseology up over the divide. At this point in history, antitoxin arrived and interrupted forever the old series. In his next fifty-nine cases the mortality was 23.7 per cent."

Recognizing that the past year was doubtless exceptional in many a section of our country for the small number of cases of diphtheria which appeared, it may nevertheless be observed that, incidentally with the more general introduction of serum therapy, we have a decrease in the number of cases as well as in the severity and popular dread of the disease and the rate of mortality. This wholesome change is due to an ever broadening and deepening conception of both diphtheria and its *biologic antidote*, antitoxin.

The resort to immunizing injections to prevent the spread of diphtheria to other members of the family where a case or two has appeared, is not so largely practiced as the value of the measure demands, but is rapidly gaining in popular favor. But aside from any resort to this measure, it is evident that serum therapy has exerted a most potent influence in restricting the number of cases. While it is always within the range of possibility for the most malignant case to follow the mildest case, yet the proneness to spread the infection is always greater in severe cases. Admitting this, it is clear that whatever checks malignancy also controls the tendency to spread and materially restricts the number of cases that would otherwise occur. This beneficent influence can never be adequately estimated, although it is very considerable. One of the most encouraging experiences of many a general practitioner who has adopted the serum treatment of diphtheria, is that he now only occasionally meets more than the initial case or cases in a family. Many of the latter class even assert that they never even meet the exceptional new infection.

In view of all these facts, it would seem that the attitude of the general practitioner toward the serum treatment is a more seasonable subject for discussion than the merits of antitoxin. In the investion of this most interesting subject the initiative was doubtless taken by Dr. George L. Cole of Los Angeles, Cal., who made a study of the question in his own State and reported, recently, in an admirable paper entitled "Sero-therapy," before his State Medical Society. In reponse to a circular letter addressed to about three hundred physicians he received replies from 156. Of this number, only four expressed themselves as antagonistic to serum treatment, but none of these had personally tried the remedy nor had a desire to do so. With the opportunity to compare the clinical notes of hundreds of physicians who have each treated many cases in private and hospital practice, of thousands of others who have less numbers, and with the unequivocal results of great collective investigations conducted both at home and abroad, it would seem that even the most obscure general practitioner is no longer justifiable in refusing to give his diphtheria patients the full benefit of the more humane and successful serum treatment. According to my personal observations, this effect is rapidly being attained. Physicians who were once loud in their opposition are now warm advocates, or in preference to the humiliation of a public retraction, have become secret users of antitoxin.

Speaking of the product, as now freely available to every physician, it is to be observed that marvelous progress has been achieved. I was one of the first in the East outside of our large cities to employ the remedy. That was before antitoxin was prepared in Philadelphia for commercial or other purposes. The article was then difficult to procure and very expensive. The quantity of serum necessary to inject in order to secure what was then regarded a full curative dose was inordinate, being upward of one fluid ounce. The syringe which I then employed has long since been laid aside as suggestive rather of minor rectal surgery. The improvements which made it possible to inject much larger doses in very much smaller quantities of serum, that is to say, which gave us concentrated serums, are without parallel elsewhere in the pharmaceutic sciences.

One year ago the most concentrated product in the market contained 500 immunizing units to each cubic centimeter of serum, but at present serums are available of 1000 and even 2000 units per cubic centimeter. The latter, it seems to me, have reached a degree of concentration which is no longer advantageous or even practical. A serum which contains nearly 150 immunizing units to each minim of the serum, or even half this strength, is relatively difficult to handle, owing to the small bulk and the unavoidable source of loss, while it remains a question whether such high concentrations possess any special therapeutic advantages at all. It seems to me, and in this I voice the sentiment of the general practitioners with whom it is my pleasure to exchange views from time to time, that a product permitting the administration of 1000 units of antitoxin in from 2 to 4 centimeters, i. e., from one-half to one fluid dram of serum, if well ripened and conveniently bottled, is the ideal antitoxin from every point of view. It is conceded that the more concentrated the product is the more readily deterioration takes place, so that the higher strengths are relatively unreliable after one to four months. This in itself is a considerable disadvantage to the general practitioner, who, more often than any other class of physicians, finds it indispensable to keep an available quantity of a strictly reliable product constantly upon his shelves. To him there are a score of elements that enter into a particular antitoxic serum of vastly more importance tnan higher degrees of concentration, per se, however commendable as an achievement in its preparation the latter may be. Chief among these elements I would name a high unit value, seasoning of the serum, a definite system of standardizing, convenient and sufficiently strong bottles and uniform potency.

DISCUSSION OF DIPHTHERIA.

Dr. Louis Fischer, New York City—In the paper of Dr. Engleman this morning I was interested in hearing that her results with the mixture of the antitoxin with anti-streptococcus serum were good. I was very much interested recently to hear from some gentlemen discussing the subject, that they

endorsed the view I maintained, namely, that antistreptococcus serum today can not be classed as a remedy to be used. My experience dates back but two years, when I had the pleasure of seeing a series of cases under Dr. Baginsky of Berlin. We did not find it of value. In one case, in which the antistreptococcus serum was used, the bad effects were due to its use. Today we have not a streptococcus antitoxin, but only an antistreptococcus serum, which is not equally of value in all cases. While doing good in erysipelas, it does not do good in cases of scarlet fever, although we have proven that the streptococcus is the etiologic factor in scarlet fever. Therefore, I wish to reiterate what I said in New York, that I believe the time has not come when we may say that we are permitted to use the antistrepticoccus serum in the same sense that we use the antitoxin in diphtheria. I would be pleased to hear if the various authors who have read today will state whether they have used this with the antitoxin, and their success.

Dr. Engleman stated that she fully believed the etiology to be still in a confused state. Mr. Chairman, I can only tell you of a very interesting case of a child who had an affection of the throat and showed the Klebs-Löffler bacillus. A child brought into the hospital for the relief of a phimosis, was operated upon and some of the smegma inoculated in a test tube. When placed under the microscope beside a culture obtained from a case of diphtheria, a friend of mine, who is a bacteriologist, was absolutely unable to differentiate them. When in Berlin I saw the streptococcus and staphylococcus in a great many cases. While the accepted theory is that the Klebs-Löffler bacillus is the sole cause of diphtheria, and that it can produce diphtheria, I think there is still room for improvement in the study of the etiology of diphtheria. I learned from another bacteriologist, who said he knew of the bacillus of smegma, that is similar to the diphtheria bacillus. I need only say a word of the pseudo-diphtheria bacillus, which is frequently present under normal conditions.

Passing to Dr. Jerowitz' paper, the gentleman referred to the fact that he does not use iron. I was rather surprised to hear that statement, because I regard iron as one of the most important drugs in the treatment of diphtheria. While the accepted conclusions in regard to antitoxin are so positive, I believe iron still holds its own as a remedy in diphtheria. The treatment of diphtheria was in such a condition of chaos four or five years ago, in regard to this antitoxin question, that I believe we are to be congratulated on the progress made in this line, and I believe it is due largely to some men who have gone throughout the country and advocated the use of antitoxin. Largely it is due to such work as that of Dr. Rosenthal. I will state, however, that I do not use antitoxin in every case. It was only about two months ago that Dr. Garrigues telephoned me to bring enough antitoxin for four cases. But I found only some little spots, which by a little gargling got well. I know another case in which by using a little wash the child recovered. I do not use the antitoxin unless there is no improvement in twelve hours. However, if I am called to a case in which a whole tonsil or the palate is involved or when there is stenosis, I would regard it as criminal not to use antitoxin. I never give under two thousand units of antitoxin in any case.

The paper of Dr. Waxham is a valuable contribution. The statistics are such that it would be a crime not to use antitoxin where there is laryngeal involvement. The Doctor has shown the old tubes of O'Dwyer. We have had the rubber tubes introduced; I believe I showed some of the tubes last year at the meeting of this Section in Philadelphia, and we have been using them since. The lime salts do not deposit on them, which is of value especially in the cases where we must use the tubes for a long time. In the case of a child I intubated on February 20, I am confident if I had used a metal tube I would have had to use a series of tubes by this time, but the rubber does not permit the deposit of lime salts on the surface. Dr. O'Dwyer's new sets have also these new tubes and they are made according to his own directions. The tubes I use are made corrugated, because I find them so slippery that they are coughed out if we do not have them corrugated. The gag of Dr. Waxham I have used and I believe it is an excellent gag. I should like to ask Dr. Waxham how he treats his prolonged cases of stenosis. Some cases were reported by Dr. O'Dwyer at the last meeting of the Pediatric Society. I refer to the class of cases where you have intubated and left the tube in for a week or ten days, removed the tube and have stenosis, and must they have prolonged intubation? I have mentioned a case where the child has worn the tube over three months. I have tried tracheotomy in several of those cases and I have found that each and every one of them has died.

Dr. ROSS ENGLEMAN, Chicago, in closing.—I have nothing to say, except to emphasize the subject of polymorphism of the Löffler bacillus. As the Doctor says, I think the subject is still in an experimental state. I do not think we can say certain symptoms refer to the staphylococcus or streptococcus or Löffler bacillus infection, because of this polymorphism, and we often do not get anything except a mixed infection. In my series of cases I did not use the antistreptococcus serum in sufficient doses, so I would not express an opinion as to its use in these cases. As to the question of the prolonged intubation, I am very glad to hear from Dr. Fisher of the use of the rubber tubes. I have had a few cases that were very troublesome and shortly after I had those cases I read O'Dwyer's article, I think in the July number of the *Archives of Pediatrics*, in which he referred to the use of alum and paraffin, which seemed very ingenious and with which he said he cured his ulcers in a short time where the tube had been worn three months or longer.

Dr. JAQUES, Chicago.—I had charge of the South Side Dispensary in Chicago at the time Dr. Waxham was beginning his career as an intubator and I have called him out, in the most bitter and disagreeable weather, and he never has failed to respond to perform intubation. In nine out of ten of those cases death followed. When I recall the experience he went through I am glad no such experience will be possible for the next generation. We should have in mind always the fact that it takes two things to make a case of diphtheria: First, the predisposition to the disease; second, the presence of the germs. I have frequently obtained cultures of the Klebs-Löffler bacillus from my mouth, although I have never had diphtheria in my life. In any individual not susceptible to diphtheria, there is, through the action of the cells, an antitoxin produced which protects the individual from the action of the germs. When the individual loses this condition of resistance or it falls below a certain standard and the Klebs-Löffler bacillus is introduced on the membrane, Klebs-Löffler diphtheria will follow and will progress according to the susceptibility of the individual. Unless you have the clinical symptoms following the finding of the germ, you do not have diphtheria. Dr. Waxham, in his paper, stated that he always gave at least two thousand units to a child and more to an adult. If you will pardon me for a moment, I wish to illustrate the stand I have taken, that the younger the child the larger the dose of antitoxin should be, not in the amount of serum but in units. We understand that the growth of the bacilli produces the ptomains. In the experiments we estimate the amount of toxin which kills the animal by the size of the animal, and the smaller the animal the smaller the amount of toxin required to produce the animal's death. The growth of bacilli here is as large in the infant as in the adult, and therefore a larger amount of antitoxin is required. I use three or four thousand units in infants. I want you to beware of the concentrated antitoxin. A drop will stay in the syringe, a drop will be lost, probably, in seeing that you do not inject

any air. I prefer the antitoxin of average concentration, say 5 cc. to three or four thousand units. One of the gentlemen who read a paper said he did not think antitoxin is a preventive of paralysis. I do think the gentleman has carefully considered that statement. You might as well say that water does not prevent the spread of fire. Antitoxin does prevent paralysis. The toxin produced by the Klebs-Löffler bacillus causes necrosis, and when that ptomain accumulates to a sufficient amount to produce destruction of the corpuscles of the blood, the kidney tubules and the destruction of the vital centers, the patient will die. So if you give your antitoxin it must be given before this destruction occurs and then you will prevent paralysis.

Question.—I would like to know how long they quarantine patients to prevent the spread of the disease.

Dr. JAQUES—In the Health Department of Chicago we do not placard any house unless the Klebs-Löffler bacillus is found in the case and the diagnosis is made by one of the inspectors in the health department. We have not followed the quarantine very carefully for the reason we work there in harmony with the physicians. We are simply the assistants of the physician. We say to the doctor, you go to your patient, take with you a little culture material, give it to us after inoculation and it will be returned to you as your private property. The patients do not know in one-fifth of the cases that the health department had anything to do with the case. The physician is responsible for the spread of the infection, and he looks after it then very much better then the health department could do. As a result our diphtheria statistics, as perhaps you know, have been remarkably low, being in the charity cases only 6.7, when formerly they were nearly 40.

Question—How long do you keep the house placarded?

Dr. JAQUES—We leave that to the discretion of the Doctor. Often it does not stay on the house over an hour and often it remains on the house for a long time. The patient is at once isolated, and if the patient is isolated and put in the care of a trained nurse, the individuals in the house are in no more danger than an individual in an ordinary street car. If the physician desires to take the responsibility of the case, the placard need not go on the house at all. Every doctor knows that when he calls on the health department he will not be interferred with in any way. If the patient is so poor that antitoxin can not be bought, it will be furnished them by the health department without cost.

Question—I would like to ask the physician from Chicago, if when he found the Klebs-Löffler bacillus in his throat, and thought he was not subject to diphtheria, did he not think he was a menace to other persons, who were debilitated?

Dr. JAQUES—I think the only time I would be a menace would be when kissing, and I am not subject to that habit. When I found this bacillus in my throat, I was very careful to take means, by gargling, to keep my throat from being a subject of infection. I have gone from a case of intubation to a case of confinement and performed version and do not know that I ever transmitted diphtheria. There is a great mistake in the belief among the general public as to the contractibility of the disease and the danger of physicians. If they are clean, there is very little danger of contagion. Contagion is spread only by contact and not at all through the air.

Question—Do you ever fumigate the premises after a case of diphtheria?

Dr. JAQUES—We have spent several thousand dollars in the last year in the practical methods of fumigation, and we have found formaldehyde gas one of the most practical methods. It is clean, leaves no odor and is one of the simplest and best methods. We simply take formalin, or the 40 per cent. solution of formaldehyde gas, add four parts of water, stop up the cracks in the room, extend a sheet across the room and throw the solution on the sheet. We then get out of the room as quickly as possible. The disinfection is perfect. We place tubes, wrapped in flannel, in various places in the room and if any of them grow, the disinfection is repeated. This does away with the use of sulphur and we find it by far the best method of disinfection.

Dr. AGNEW, Philadelphia—I think Chicago does better than Philadelphia. In the first place, we have a hard and fast law that all cases have to be placarded. When the culture is made the house is placarded and the placard is removed when disinfection is attended to. I believe one of the causes of spread of the disease is the non-report of cases of diphtheria, due to the fact that the placard interferes with people's business. I think, myself, there ought to be discrimination and where the physician in charge is willing to assume the responsibility of isolation, the placard should not be on. But the act of 1895 states that a placard shall be put on, and the Board of Health of Philadelphia, who have the discretion in this, have insisted on this placard being put on every house. One of our most distinguished physicians in Philadelphia unfortunately had a case in his house, that I am satisfied everything was done to isolate, but in that case the placard was put on his house. I believe cases of diphtheria can be so taken care of that the risk to other people will be reduced to the minimum, probably reduced to nothing. It would be interesting to know whether in Chicago they use force to remove patients, where the doctor does not assume control of the case. We have to deal with a population in my city where no isolation is used and we are allowed to send a force in and take the patient out. You will all admit that under such conditions a case taken to our municipal hospital removes the center of contagion. There is no question, when such a case is removed, that a benefit is conferred upon the city. I know, myself, of a case which was not reported, that was visited by children invited from a kindergarten and several lives were lost and several children were sick for a long time. I believe at least a hundred cases were kept out from the epidemic traced to this case. The case was not reported and the doctor was brought into court and fined $5 for I don't know how many lives and how many cases of diphtheria.

Dr. W. H. SEIBERT, Pennsylvania—We have had the pathology, symptomatology, treatment, preventive measures, and even down to the police regulations, but one point has not been mentioned. I refer to diphtheria occurring in regions not accessible to view, as in the alimentary canal or possibly in the posterior nares, where, however, it might be seen by proper instruments, and in other regions. The Doctor has stated that he has gone from intubation cases to obstetric cases without danger. Recently, I had some experience where a consultant, who had been treating malignant cases of diphtheria, was called to help in a case. I asked him to examine the case, which he did. He did not speak of his diphtheria case until the after-course of our case of obstetrics. There were peculiar symptoms appeared. In fact, there were the general symptoms of diphtheria, but there were no symptoms of diphtheria about the throat. The main symptom was complete anorexia, absolute repugnance of food. That has not been referred to but is usually understood. On examining everywhere, carefully, I could find nothing to indicate diphtheria until with the speculum I examined the vagina. On the fifth or sixth day we found a diphtheritic patch inside of the vagina, which was nearly an inch in diameter. The case occurred before the introduction of antitoxin, and the patient went on and died from diphtheria. A few years ago, J. Lewis Smith reported a case which died from what he had treated for some time for typhoid fever, but before death the patient passed a complete cast of the intestine, which proved to be diphtheritic on examination.

Dr. WELCH of Philadelphia—It seems I find myself in the enemy's camp. That is to say, I stand alone in this matter. I

have seen diphtheria, having had charge of a hospital where infectious diseases are constantly treated, for the past twenty-eight years, and during the past six or eight years we have been receiving large numbers of cases of diphtheria, along with scarlet fever and some few of the other infectious diseases. The death-rate in our hospital before the days of antitoxin was never anything like as high as has been stated here by some of the speakers today. Our death-rate before antitoxin was from 28 per cent. to 30 per cent., or along there somewhere as near as I can recollect now. And, gentlemen, it remains there today. We have not reduced the death-rate whatever. It is true in 1894 the death-rate was higher than ever; it was high all over the world. That is known by all who followed the literature of the period. The death-rate in our hospital was about 30 or 33 per cent. It was about the same in the Willard Parker Hospital of New York, and in the Metropolitan Hospital. However, in some of the hospitals the death-rate has been very high, as high as stated here today. After antitoxin came to our notice in 1894, we did our best to procure this agent, that our patients might have the benefit of it. We succeeded in the fall of that year and were able to give it to only sixteen cases, I think, in the latter part of 1894. We watched those cases with a great deal of interest. Their temperatures were taken every hour or two, notes made every little while, and we had complete histories reported of the first five cases. They were pretty nearly the first cases in which antitoxin was used in Philadelphia. Dr. Fischer, who is present, knows something of those five cases; two of them died.

We continued, and that year used antitoxin in about sixteen cases, but it was not lower than the usual death rate. In 1895 it was not so difficult to procure antitoxin. The preparation of the antitoxin we used then was Behring's number two. It was not, of course, as easily and readily obtained in as large quantities as at present; it was high, and we economized its use as much as possible. I attempted to select the cases which I thought most favorable to the action of the antitoxin. Everybody who had written on the subject said antitoxin was useful only when used in the early stages of diphtheria. I selected those that were from the first to the fourth day of the disease, well-marked clinical casses, some of them very severe and others not so severe, but every one of them well-marked and in every one of them the Löffler bacillus was present on culture. Those which did not receive antitoxin were, first, exceedingly mild cases, which I believed would recover without any remedy; second, cases advanced beyond the fourth day, and third, malignant or moribund cases. It was thought they would serve no fair test of the remedy. At the end of the year in counting up the cases there were about three hundred received antitoxin and over five hundred did not receive it. The cases were not analogous and could not be compared. But the death-rate among those from the first to the fourth day who received antitoxin was about 28.14 per cent., while among the other class it was 25 per cent. and a fraction, I think very nearly 26 per cent. Now, I do not say that these series of cases should be compared, for they are entirely different, as I have told you. I was surprised that the death-rate should be so high. In closely watching these cases after the administration of antitoxin, particularly my early cases, no one can well imagine my disappointment. I really expected antitoxin to do all they claimed for it. It did not. Now, I have no prejudice; I wish antitoxin would do what they have said it would. I thought I would get out of writing so many death certificates, but the patients have died just the same. In watching the cases I could not see such a beneficial effect from it. Sometimes we thought we did see the change in the exudate, that it assumed a more fat-like appearance and peeled off more readily. But right along the side of them you could pick out the same number that did not receive the antitoxin but behaved in the same way. I can not say that I have observed that the exudate disappears more quickly after the use of antitoxin. If there is any difference it is not striking. There are some cases where it peels off quickly, there are other cases where it remains for a long time, there are cases where it disappears and re-appears, and there are cases where it travels even down into the larynx. A good deal was said about the temperature. Temperature in diphtheria counts for very little; except in the worst cases it is usually low. In the vast majority of cases the temperature is high at first, but in a short time it sinks to normal, or nearly so, and in bad cases to below normal. In the hospital you will see very few cases with high temperature, except in cases of broncho-pneumonia. This is very common and many of the intubated laryngeal cases die from it. Many of them die late; some die two or three weeks after they have been admitted into the hospital. A week or two after the tube has been removed bronchial pneumonia develops and they die. We all know the theory by which antitoxin acts, the theory of immunity, that in a person who has suffered from some one of the infectious diseases there is an antitoxin produced in the blood and that this antitoxin protects them against future attacks. This is a beautiful theory, but it seems to me it is not proved. No one has ever discovered antitoxin, described it or told us anything about it. Now, what does nature show us? What do we find in practice in our daily observations? Take, for instance, a woman who is rendered immune to smallpox, which is a common disease and one of the most contagious and infectious diseases we have. Take a person immune to smallpox, either by reason of vaccination or previous attack, say the individual is a female and there is an antitoxin developed in her blood which protects her. That woman becomes pregnant and gives birth to a child. That child, it seems to me, should receive immunity from its mother. Yet that child, from the time of its birth, is susceptible to the disease. The woman may not be affected by a disease to which she is immune, but the fetus in utero may be susceptible. If it will protect her, why will it not protect the fetus in utero?

Dr. R. B. GILBERT, Louisville.—My experience has been so much in common with that of Dr. Fischer that I regret the last speaker. I have treated cases without the serum and have had a mortality of 65 or 70 per cent., and with the antitoxin I have had a mortality of from 7 to 10 per cent. The cases were in the same epidemic with the same environment and proper attention. I believe antitoxin should be used early and in the quantities stated by Dr. Fischer. In a case of laryngeal diphtheria in a child under two years of age it is scarcely worth while to use the serum late. But if we see such a case early we might have quite a success with it. My experience has been only in general practice through a number of epidemics and not in hospital practice. I have succeeded in saving a large number of cases, which I know would have died had I not used the serum.

Dr. SIMMONS of Nebraska.—I am sure antitoxin is as nearly a specific for diphtheria as any medicine we have for any other disease. I do not believe quinin is as much a specific for malaria as antitoxin is for diphtheria. In the early years of my practice I ran into a lot of diphtheria, in which all the physicians lost nearly all of their cases. Nothing could save them. Twice in my medical experience since then, once about eight years ago and once about six years ago, I had the same class of cases. During the intervening periods we had a class of cases that were mild. I have been anxiously waiting with a good deal of fear for a chance to try antitoxin in the old type of diphtheria. About two months ago I had such a chance. Until then I was ready to say that I thought what I had read was all right, for I had used it for some years, but during the last two months I have had such experience that I do not care what statistics are brought up nor what anybody else may say, I know I have saved cases with antitoxin. I will just relate two instances in two families. One was a family of nine chil-

dren. They were poor people and did not send for me or any physician until one of them was practically dead. Another case was in bed when I got there. The glands of the neck were all swollen. The mouth and the fauces as far as I could see were covered with membrane. In a bed in the same room were two other girls, and from a room above there were two boys coming down. In one of the cases there was evidence that it was going to be a very severe case. I did not use any antitoxin in the worst case because it was too far gone. To the others I gave antitoxin and I saw an immediate good effect. At the first sign of the membrane in the children not yet affected I gave immunizing doses of 500 units and they all got well. If you could have seen the cases with me, you would have believed as I do that those cases were saved by antitoxin. Across the street there was a brother-in-law who called a physician who is a bitter opponent of antitoxin. He did not use it and he succeeded in saving one of the four children. In one family the Christian Scientists created quite a rumpus but nothing was done to them. In that epidemic there was not a case died in which antitoxin was used and nearly all the other cases died. Therefore I feel like saying what I said two or three weeks ago in our local society, that I believe today a man is criminally negligent of his duty who fails to give antitoxin in diphtheria.

Dr. JOHN A. LOCKARD—From my experience as interne in the New York Hospital, I wish to emphasize what has been said about the mortality. In six months' experience there I have failed to see the membrane melt away any quicker with the antitoxin than without it. I have failed to see the so-called "black" diphtheria get well under the antitoxin treatment. In one class of cases I saw a good result, and that was in the cases intubated. In its effect on postdiphtheritic paralysis I have seen no results you could call good. I have seen cases of heart failure with regurgitation just as marked and frequent. As to the antistreptococcus serum, we found that most of the incubated cases died from subsequent pneumonias. We took the cases with no physical signs of bronchitis on admission and injected the antistreptococcus serum, 2 c.c. every day. Out of the six cases we lost five. We found the rashes most confusing. The rashes of this and scarlet fever were so much alike that barring the throat symptoms they would be very confusing. I think, however, the statistics from the hospital are likely to lead us astray, especially in certain directions. Usually the cases sent in are old cases. The children have parents who are not particularly careful in observing the children and they do not recognize the disease until it is pretty well advanced. Another way in which the statistics may err is that we admit many cases as diphtheria which upon bacteriologic examination would be called a mere tonsillitis. In the children we do not have an opportunity to observe the melting of the membrane as well as in the adults, because we were required to give antitoxin to all the children. But in adults it was optional, and we occasionally advised them not to take the antitoxin that we might observe the cases. Side by side, cases as near alike clinically as we could possibly get them, I have seen the membrane melt away without the antitoxin and others who had antitoxin remained in the hospital weeks longer. Another peculiar and significant fact, it seems to me, is that when our nurses become affected with diphtheria they do not use the antitoxin, and the same was true when my predecessor and successor had diphtheria.

Dr. H. D. JEROWITZ, Kansas City, in closing—In respect to intubation, I might have had a great many more cases in my practice if I had been permitted to perform intubation when I wanted to, but as the majority of the cases were among ignorant people, they were very much afraid of mechanical treatment. Many of these cases presented cyanosis, upon whom I wanted to intubate, and the majority got well just the same. The difficult breathing seemed to be only transient. It shows the fact that a great many cases that seem to require intubation or tracheotomy at the moment you see them, may have the spell pass off in a few mominta and the case for the time being will be better. Very often when these cases present urgent symptoms, the cyanosis and dyspnea are due not to the membrane, but more to the mucus, which may not be brought up a certain moment, and if an emetic is administered, or the child has a severe spell of coughing or crying, the urgent symptoms pass off and the necessity of intubation or tracheotomy is obviated. As to the use of iron, we all have our own opinions, which are based upon our own experience. I used iron in the early part of my practice, but I never could see the rationality of it, nor could I see why it cures these cases. Besides, my experience is that the cases that can be benefited by iron, can just as well get well with other treatment. I can not see what such an irritating remedy as the perchlorid of iron can accomplish in such a disease as diphtheria. It seems to be a very irritating drug, not only constringing the membrane of the throat, but of the stomach and bowels as well, thereby interfering with assimilation. I think the value of it is more from the chlorin, and for that reason I often use hydrochloric acid internally, expecting also an effect from it as it passes the throat. As to the antitoxin, the dose must be large. Two thousand units may be employed three times a day in laryngeal diphtheria. One gentleman referred to the fact the statement was made that antitoxin does not prevent paralysis. My paper did not say so. I said paralysis occurred in those cases that were either severe cases or cases of long duration. Those cases in which there was extension of the membrane or which lasted ten or fourteen days, were as a rule followed by paralysis. Then I further stated that in all cases where the antitoxin is used early, the membrane disappears in two or three days and it shortens the sickness, and from this fact it prevents paralysis. I stated that if the antitoxin was used early, no paralysis is found. Now, as to the spread of diphtheria and the placarding, it is very evident that there are a number of mild cases that do not go to bed and are not recognized, and children having a very mild form of diphtheria, that are hardly sick except possibly a slight headache, may go to school and spread the infection to others.

Dr. F. E. WAXHAM, Denver, in closing—In regard to the paper presented by Dr. McClanahan, I would agree entirely with his conclusions, so briefly and explicitly set forth. In regard to the paper presented by the first essayist, I would say that on account of my confidence in antitoxin I have discarded all gargles, sprays, iron, and other remedies. I simply give a large dose of antitoxin, repeat it in ten or twelve hours, and give a third or fourth dose, if necessary. Antitoxin has been compared to vaccination. I think that is not proper at all. The vaccine disease is another disease; it is a disease, smallpox, modified by passing through the system of a cow. There is simply no comparison between antitoxin and vaccination. In regard to the health department, I was very much interested in the methods employed in Chicago. They are quite different from the methods employed here. Here the physician inoculates a test tube and takes it to the health department; if it is found to be diphtheria, the health department takes entire charge of the case. They isolate the case, and make repeated examinations of the patient's throat. As long as the case shows any bacilli in the throat, the case is isolated and the house placarded. If Dr. Jaques lived in Denver, he would not have the temerity to have the secretions of his throat examined. I am much surprised that any one, at this day, can oppose the use of antitoxin. I can not understand how any one, after reading the conclusions of the Pediatric Society, can fail to be convinced of the utility of antitoxin. After my experience in the treatment of diphtheria, I would feel that I was not doing my duty as a physician, not doing my duty to my profession, unless I advocated the use of

antitoxin as the greatest remedy that has been presented to the medical profession during this century. I can not but believe there must be something wrong in the methods employed by those who have found so little benefit from its use. They either have not used the remedy early, or have not used the remedy in sufficient doses, or have not repeated it when necessary. I suspect the cases that have come under Dr. Welch's care are late cases, for frequently we know cases are sick three or four days before they are taken to a hospital. Then, if a bacteriologic examination is made before treatment is begun, another twenty-four hours is lost. I feel like agreeing with one of the speakers when he says that he would feel guilty of criminal negligence if a case died under his care and he did not use antitoxin.

Dr. H. M. MCCLANAHAN, Omaha—I only wish to bear testimony that I believe most thoroughly in the use of antitoxin. I believe, however, we must not expect everything from this remedy. I believe the statement by Dr. Welch, that antitoxin can not undo the harm diphtheria has done, is true. I think the cases crowded together in the hospital will not do as well. But I think his line of argument should not give us reason to not use the remedy in private practice. In the cases mentioned by Dr. Welch, I have no doubt he found mixed infection, over which antitoxin has no influence. I think we should get a clear idea of what this remedy should be expected to do, and what it should not be expected to do. I became thoroughly disheartened and discouraged with antitoxin. The patients would be relieved a few hours, and then the patch would extend on down. After the use of antitoxin in the past year I have intubated only twelve cases, and eleven of them have recovered. I can go back five years, when the patients under tracheotomy or any other treatment that we had, gave a mortality of 50 or 75 per cent. It would be a retrograde step if we were to allow ourselves to lose our faith in the use of antitoxin. But we should not expect it to do everything. When your examination shows that you are dealing with a mixed infection, then let us not stop with the use of antoxin. Then I believe nascent oxygen is of benefit. Even some of those cases can be saved by the use of nascent oxygen with antitoxin. In one case I saved a child in this way when the lips were blue. It leads me to believe I will never give up a case of diphtheria until the case is cold and stiff and dead. I have the most profound belief in the value of antitoxin in neutralizing the toxins of diphtheria.

THE EARLY DIAGNOSIS OF DIPHTHERIA.

Read before the Mississippi Valley Medical Association, Oct. 13, 1898.

BY WILLIAM K. JAQUES, M.D.

DIRECTOR ANTITOXIN STAFF HEALTH DEPARTMENT CITY OF CHICAGO.

Outside of laryngeal complications, the mortality in diphtheria is due to the toxin produced by the Klebs-Loeffler bacilli. No physician can successfully treat diphtheria unless he understands the nature of this toxin, how it is produced, and how the cells may be fortified against its destructive action. He must understand that the Klebs-Loeffler bacillus is a distinct living entity or vegetable organism; that one of the products of its existence is diphtheria toxin, just as the result of the life of the yeast plant in alcohol.

Other germs in anginas will cause inflammation, pain, temperature and membrane, but only the Klebs-Loeffler bacilli produce the deadly toxin which begins with their invasion and progresses to a fatal amount as swiftly as conditions permit.

To appreciate the danger of his patient, a physician must understand the rapidity with which these bacilli multiply under favorable conditions. The clinical symptoms manifesting their residence may give no indication as to the rapidity with which the fatal amount of toxin is being produced. The best means of comprehending this fact is to use the microscope and follow the multiplication of the Klebs-Loeffler bacilli in their cultural life. Inoculate a box of culture-medium with infected mucus and place in an incubator at body temperature. At the end of three hours, a cover-glass pressed upon the surface, properly stained and mounted, will show sufficient bacilli, if they are present, to give an idea of the number and arrangement of germs upon the surface of the medium. Incubate the same culture eight hours, and an examination will show that the germs have multiplied many times. Eighteen hours will reveal a large and complete colonization, from which an idea can be gained of the way in which the Klebs-Loeffler bacilli multiply under favorable conditions. Understanding, as we do, that toxin is a product of these germs, their multiplication means an increased amount of toxin, which soon reaches the fatal point unless checked by the use of antitoxin. This demonstrates the importance of a physician knowing at the earliest possible moment what germs are present in an angina. It may be said that in the majority of cases there are two things he does not know: the extent of the infected area, and the resisting power of the patient.

The diagnosis of diphtheria in the early stage of the disease must be made from both clinical and bacterial evidence. From his patient the physician finds clinical manifestations of an invasion of the mucous membrane of the respiratory tract. When his microscope reveals the germs that are causing this invasion, he can then say whether or not the disease is diphtheria. Delay in ascertaining this information can only be done at great risk to the patient's life and the doctor's reputation.

In order to ascertain the value of direct diagnosis,—by which we mean the examination of material taken directly from the infected area without waiting for incubation—the Chicago Health Department has introduced the following culture outfit for the use of physicians; a sterilized swab is placed in a glass tube; a slide carefully wrapped in paper is placed with this in an envelope together with a culture box and directions for using same. Physicians are requested to inoculate the swab from the inflamed site, spread a little of the mucus upon the slide and allow it to dry. The culture medium is inoculated from the same swab and it is returned to the glass tube. The whole outfit is then to to be sent to the nearest incubator station or laboratory.

As this method has been in use but a short time, its value has as yet to be demonstrated conclusively. From my own experience I have received very valuable information. In one case I did not find any Klebs-Loeffler bacilli in the culture medium but found that a large colony of the bacilli had incubated upon the mucus which was still left upon the swab. In a number of cases I have been able to make a direct diagnosis by staining and examining the slides as soon as they come to the laboratory. When no antiseptic treatment has been administered before the culture is taken, and the disease manifests malignancy, by stupor, hoarseness or swelling of the cervical glands, it has been possible in about 50 per cent. of the cases to find sufficient bacilli to warrant a diagnosis of diphtheria, sometimes before any trace of membrane is visible. When it has been possible to get a small

portion of membrane to spread on the slide, there has been no difficulty whatever in about 75 per cent. of the cases in making a direct diagnosis.

Cases in which the Klebs-Loeffler bacilli can not be found by direct examination will lose very little by waiting for incubation of the culture.

A bacteriologist can not be sure that his examination reveals the true condition of a case unless he knows the material was correctly obtained. In a laryngeal case, mucus from the mouth may not have become infected sufficiently to show the bacilli present. This may also be true with an invasion of the cervical glands; but if a piece of membrane is obtained from the tonsils and found not to contain the Klebs-Loeffler bacilli, the probabilities are that it is not diphtheria.

In large cities, where examinations are made by the bacteriologists of health departments, a physician may perhaps be pardoned for not acquainting himself with the technique of examinations. At the same time, the more a physician knows about the bacteriology of diphtheria, the more accurate will be the results from the perfectly taken cultures which he sends to the laboratory. One of the greatest disadvantages we have to labor under is the faulty manner of making cultures by physicians who know nothing of bacteriology. Even if the culture is recognized as imperfect before incubation, it means at least a few hours' delay in securing another.

Because of the contagious nature of diphtheria, the health departments of large cities have been making bacterial examinations for physicians, and the success of the work in controlling and limiting the disease, as well as its statistical value, has justified the expense. As long as there was no specific for diphtheria, the diagnosis was not of such vital importance. Physicians could prescribe local treatment and await developments. Now that we have a remedy which, when properly used, may truly be called a specific, and when the life of the patient depends upon an accurate diagnosis, the responsibility of the attending physician is very great.

In the malignant form of diphtheria nearly 50 per cent. of the cases die unless proper treatment is administered. Any physician who neglects to make a correct diagnosis during the time when the remedy is efficacious—that is during the first two or three days—is responsible for the result. He is responsible because it is within his means to obtain the knowledge which will make him competent to treat the disease intelligently, and therefore successfully. He is also further responsible in permitting the continuance of infection to endanger the safety of the community. The technique of the bacterial diagnosis is simple. The entire outfit for this work may be obtained for less than one hundred dollars. The essentials may be acquired at home by any physician who is willing to devote no more than his leisure moments to it.

The users of antitoxin everywhere emphasize the importance of its early administration. In a paper by Dr. Edwin Rosenthal of Philadelphia, read at the meeting of the AMERICAN MEDICAL ASSOCIATION in Denver, he gave a statistical record of sixty cases in which he administered antitoxin, with nine deaths. The recoveries are not more instructive than the deaths, in all of which the record shows antitoxin to have been administered from the third to the ninth day. The child who received the antitoxin on the third day died of bronchial pneumonia. The other cases, all being in an advanced stage, illustrate in a forcible manner that antitoxin had not been given until after the destructive action of the toxin, against which no remedy is proof.

To demonstrate the protective value of antitoxin, the following experiment has been conducted: On October 10, in the presence of Dr. F. W. Reilly, assistant health commissioner of Chicago; Dr. Wynekoop, assistant bacteriologist, and myself, Dr. Adolph Gehrmann, city bacteriologist of Chicago, injected nine guinea pigs with four-times-fatal doses of diphtheria toxin. The first three were immunized two days previously by the injection of .1 c.c. each of Parke, Davis & Co.'s antitoxin. The next three received .2 c.c. of the same antitoxin each, following the injection of toxin. The third three have had no treatment whatever since the injection of the toxin. The pigs are here, and are correctly labeled as to condition, which presents decided effects on this, the fourth day. All pigs that received antitoxin are alive and apparently well. Of the three not protected, two are dead. The third, being still alive, would indicate the possession of natural immunity against the toxin.

From my connection with the Chicago Health Department, four years ago, to the present time, our efforts have been directed toward obtaining an early diagnosis in all anginas, and supplying a reliable grade of antitoxin. The best methods of work have been studied and established, with a view to assisting physicians by furnishing such facilities for the diagnosis and care of contagious diseases as they might not have themselves. As a result, our department corps of inspectors are doing harmonious work and our success in controlling diphtheria is demonstrated by the decrease in mortality from 38 per cent., not including laryngeal cases, to 6.7 per cent., including all forms of the disease. During the month of September, the department treated 108 charity cases, 66 of which were bacterially verified as true diphtheria, with three deaths. Two of these cases were in the last stages of toxin poisoning when the inspector was called. It has become possible by improved methods to give a physician a diagnosis within an hour from the time he makes his first call, if a direct examination can be made; if not, he receives his answer in from six to ten hours from the time the specimen is received.

It is fair to assume that our remarkable success in controlling and limiting diphtheria is due to the methods employed, the most important rule of which is, *first and always, secure an early diagnosis, then lose no time in applying the remedy.*

SOCIETY PROCEEDINGS.

Mississippi Valley Medical Association.

Twenty-fourth Annual Meeting, held at Nashville, Tenn., Oct. 11–16, 1898.

FIRST DAY—MORNING SESSION.

The association met in the hall of the House of Representatives at the State Capitol, and was called to order by Dr. DUNCAN EVE, chairman of the committee of arrangements. Prayer was offered by Rev. JAMES I. VANCE, D.D. Addresses of welcome were delivered by Hon. J. M. HEAD, on behalf of the city and State, and Dr. C. S. BRIGGS, on behalf of the profession of Nashville.

Dr. JOHN YOUNG BROWN of St. Louis delivered the President's Address, after the reports of the secretary and the treasurer had been read and accepted. He selected for his subject, "The Mississippi Valley Medical Association," and dealt with

the history of the association, saying that it was organized twenty-four years ago. Its rapid growth is due to the loyalty of its members and to the fact that from its inception it has been a distinctively working body; it has never been a mutual admiration society. He gave suggestions for its improvement, and said that inasmuch as the association contemplated the publication of an annual volume of Transactions, he would suggest that the dues be raised from 83 to 85.

Dr. CHARLES T. MCCLINTOCK of Detroit, Mich., read the first paper, which was entitled

IMMUNITY.

Of late years a large part of the laboratory work in medicine has had to do with immunity. Many facts have been discovered; in a few instances these have been of immediate practical value in the treatment or prevention of disease. But for the most part these facts are uncorroborated, often contradictory, their meaning not clear. Hypotheses have been advanced, but as yet we have no theory that will even approximately explain the facts of immunity. The future of work in this line is full of promise. For the infectious disease at least, immunity and cure are one and the same. A diphtheria patient will be cured only when his tissues are immunized against the attack of the diphtheria poison. There are several kinds and various degrees of immunity. We have a natural and an artificial or acquired immunity; apparently these are entirely different in kind, dependent on different functions of the body, effected by different substances. There is racial immunity. Again, we have an immunity correlated with age. Variations in suceptibility are noted in different varieties of the same species and even in different families. Again, there is an individual immunity. Still again, one part of the body, even one portion of the same tissue, may be immune, while the rest is very susceptible. These facts are not to be explained by general resistance, good health, etc. The most vigorous man may acquire smallpox or influenza. The healthiest cow is likely to take pleuropneumonia.

Metschnikoff's theory—phagocytic—is the best explanation we have for natural immunity. Nuclein seems to be the germicidal agent elaborated by the white corpuscle. If natural immunity is due to one or to several chemic agents, it follows that it is limited. Chemic action is always greater than life.

After recovery from an attack of certain of the infectious diseases, there is more or less of immunity to that disease. In some instances, as in scarlet fever or syphilis, this acquired immunity generally lasts for life. The immunity following recovery from disease is not proportional to the intensity of the disease process. The ability of an organism to resist the attack of disease germs or their products can be increased, trained, educated, if you will. Thus, in producing diphtheria antitoxin, we often get our horses to bear without apparent harm several times the fatal dose for an untreated horse. It may happen that diphtheria or measles may, after generations or centuries, disappear, owing to the fact that the race becomes immune.

To what extent an acquired immunity can be inherited is both an interesting and important question. This sort of immunity is usually lost, at least so far as our tests show, before the animal reaches the adult stage. This inherited immunity is not the same as the immunity of the suckling. This is due to the fact that the immunizing bodies pass into the milk. The child receives from its mother not only food, but disease-resisting power. We have active and passive forms of acquired immunity. The horse producing antitoxin is actively immune; his tissues are producing antitoxin. The child receiving a dose of antitoxin is passively immune. It has borrowed the strength of the horse. There is an immunity to poisons. The wolf thrives on putrid flesh. Some animals are immune to snake poison. The insusceptibility of the morphin user may be something more than mere tolerance. The drug may be, in part, destroyed, and this anti-power may have to do with the craving for the drug.

There is no satisfactory explanation for the facts of acquired immunity. The various theories as to the nature of antitoxin and its mode of action were given, with the conclusion that antitoxin, in some way as yet unknown, stimulates some portion of the body, and this in turn destroys the poison. There is no antitoxin, but in short, an immunizing body. Immunity and cure are the same thing.

Dr. GEORGE W. JOHNSON of Dunning, Ill., has had some experience with nucleinic acid in the treatment of pulmonary tuberculosis in cases of mixed infection, and has noticed a diminution in the number of pyogenic bacteria, and asks whether the phagocyte attacks the tubercle bacillus the same as it does pyogenic bacteria.

Dr. MCCLINTOCK replied that he knows of no reliable investigations that have been made with reference to that point.

Dr. ERNEST B. SANGREE of Nashville said it is believed by many investigators that the phagocytes eat live tubercle bacilli, and that cases in which tubercle bacilli are included in the phagocytes have a better chance to get well than those which do not contain them.

Dr. DUDLEY S. REYNOLDS of Louisville is afraid that experimental observers have failed to note the necessary equilibrium between the circulating blood current and the lymph stream. He elaborated the theory of phagocytosis, and showed how phagocytosis can never be successful if obstructions exist in the lymph channels.

Dr. C. L. MINOR of Asheville, N. C., presented a paper entitled

HYGIENE VS. DRUGS IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

Under hygienic and dietetic treatment the author embraces all such non medicinal measures as are directed toward an increase in the vitality of the organism and of its resistance to disease, and remarks that climato-therapy is but a branch of hygienic treatment, although he does not embrace it in his remarks, which are confined to the proper application to individual cases of exercise, gymnastics, massage, hydrotherapy, rest, sleep, diet, amusements, clothing and quarters. A partial and unsatisfactory use of such measures is more or less general, but unless directions be definite and specific, they will fail of their purpose. The difficulty of getting a patient to yield implicit obedience to the doctor was dwelt on; the indefiniteness of the orders given being in part to blame. If he is to recover, the patient and doctor must both work hard, no half-hearted seekers for pulmonary health being likely to recover. The necessity of carefully and fully writing out exact orders for every detail of the patient's life, to be followed religiously by him, was urged, such a prescription in phthisis being of more value than the more common one for drugs. All such measures were, for convenience, classed under three heads: Those affecting the patient's surroundings, those affecting his life and those affecting his exercise. The very common abuse of exercise was deplored, and the invariable rules were stated: "Exercise short of the point of fatigue," and "no exercise with a temperature over 100.4 degrees." Following these no mistake can be made.

A very gradual accustoming of the patient to longer and longer walks, beginning with only fifty or a hundred yards in many cases, and increasing until finally from two to ten miles can often be easily tolerated, and a judicious use later on of walks on increasing incline, till steep hills are easily surmounted, is warmly recommended. Pulmonary gymnastics was most especially dwelt upon for use in non-active cases, and among several methods for chest development and the increase of vital capacity, that form of Indian club swinging called the "double figure of eight" was chiefly recommended.

Finally, any intention to advocate nihilism in medicine was denied. In carefully selected cases certain drugs have undoubted value as adjuvants, never as the chief resource. The short life of most drugs in phthiso therapy was noted, and ascribed to the fact that no man can treat this disease long and not realize that nothing that in the least degree upsets the stomach can be anything but a curse to the patient. The only valuable results are those based on a vitalizing of the whole system, a stimulation of metabolism on a strengthening of the cells to oppose the invader. The thing to be attacked is not so much the lesion in the lung directly as the lowered vitality of the body, the diminished capacity of the lungs, and the deficiency of appetite, and drugs directed to a conquering of the bacillus *in situ*, are not to be compared with measures which enable the organism itself to acquire the strength to overcome disease. These things can be brought about best by an improvement in nutrition, which must after all come from the stomach, and an increase of the amount of oxygen taken into the lungs. Air and food are the drugs to which we can always trust; they will never deceive us. If a patient can be taught to get both in good amounts, wherever food can be assimilated and enjoyed and air breathed deeply, there is hope of cure. Throw away two-thirds of our medicine bottles and use the other third less often, carry out a hygienic plan of life, stimulate the appetite by nature's appetizers—air and exercise—which are alone permanent in their results, and which are as superior to gentian or quassia as sunlight is to darkness.

Dr. S. C. BALDWIN of Salt Lake City contributed a paper on

CONGENITAL SCOLIOSIS.

Scoliosis is the most common of all deformities; it is most often found in children under ten, rarely beginning after eighteen; it is found more often in girls, in the ratio of five to one; the etiology is in a large number of cases very uncertain. Congenital scoliosis is very rare. Tubley, of London, in the

latest English work on deformities, says that he has been able only to verify four cases.

The case reported by the essayist was first diagnosed as scoliosis when the child was twenty-one months old, but the father had noticed the "lump" ever since the child was first washed. The interesting features of the case are that the curvature is in the lower cervical and upper dorsal region. There is some pressure on the cord, as shown by the more or less deficient development of the right side. The convexity of the curve in this case is to the left. There is partial paralysis of the fore-finger of the right hand. There is sweating and flushing of the left side with none on the right.

The cause of the scoliosis in this case is thought to be the lack of amniotic fluid while in utero, probably allowing the muscular walls of the uterus to press on the fetus and hold it in a faulty position, and in this way cause a wedge-shaped development of the bodies of the vertebræ. This theory has been advanced by Weissenberg, Hirsh, and Schauz in the last year. In this case the mother was very small, and passed at the time of confinement so little water that she did not know there was any, and felt no motion comparatively during pregnancy.

Dr. SAMUEL E. MILLIKEN of Dallas, Texas, has seen one case of scoliosis in a child under one year of age, but he is not prepared to say whether it is congenital or not.

FIRST DAY—AFTERNOON SESSION.

Dr. WILLIAM L. BAUM of Chicago read a paper on

THE THERAPEUTIC VALUE OF MARMOREK'S SERUM.

He dealt with the literature of the subject in an exhaustive manner. Twenty two cases have come under his observation in which the serum was used. Of these, nineteen were cases of erysipelas; one of erysipelas plus tubercular nuchal glands; one of facial erysipelas during childbed without septicemia, and one of erysipelas with puerperal septicemia and double labial abscess. The last was the only fatal case.

The deductions he draws from an analysis of the literature and his own experience are: 1, in pure streptococcic infections the serum undoubtedly exercises a favorable influence on the course of the disease; 2, in the mixed infections the influence of the serum is noticeably demonstrable, but it merits further trial as an adjunct to other treatment; 3, considering the grave character of the complications of a nonstreptococcic nature reported, ordinary rules of therapeutics demand that in such cases, as with the diphtheria antitoxin, all indicated therapeutic procedures must be employed as well as the serum; 4, in view of the fact that erysipelas streptococci and phagocytes have been found to exist side by side in the lymph-channels, it is fair to assume that the influence of the serum is directly exerted bacteriologically on the streptococci and not entirely through a stimulation of phagocytic action; 5, the initial dose in all cases should be 20 c.c., to be followed by 10 or 15 c.c., according to the indications, every twenty four hours.

Dr. CHARLES L. MINOR said his experience is practically confined to secondary infections in tuberculosis. He had used the serum of Parke, Davis & Co., with considerable satisfaction, in preference to Marmorek's.

Dr. SAMUEL E. MILLIKEN has used antistreptococcic serum in two cases, both of which terminated fatally. One was a case of abscess of the liver, the other a suppurative appendicitis.

Dr. WILLIAM K. JAQUES of Chicago, called attention to infections in the pulmonary tract that he has found to be purely streptococcic, and in such cases he has advised injections of antistreptococcic serum with good results.

Dr. BAUM, in closing, emphasized the importance of diagnosing the kind of infection present.

Dr. ALBERT BERNHEIM of Paducah, Ky., presented a paper and reported three cases of syphilis, in which he administered blue ointment with satisfactory results by the mouth. He urges a thorough trial of this method, believing it will please the patient as well as the physician. The method of administering blue ointment by inunction is disliked by the patient on account of its nastiness and inconvenience, hence if another method of using the ointment can be substituted with the same good and quick results, why not do so?

Dr. JAMES T. WHITTAKER of Cincinnati, delivered the Address on Medicine, selecting for his subject "Diabetes Mellitus."

Dr. ANDREW TIMBERMAN of Columbus, Ohio, followed with a paper entitled

MASTOIDITIS: WHEN TO OPERATE AND HOW.

The causes and symptoms of this affection were described. To know when to operate one must be able to exclude the diseases which are often accompanied by inflammatory conditions over the mastoid, without actual involvement of the bone, and which quickly recede when the primary disease is properly combated. Every physician in his experience sees cases of simple furunculosis, and diffuse external otitis presenting as marked symptoms, painful and swollen mastoids. The tissues are boggy and the edematous condition is determined by palpation and pain on pressure. Such disease, as well as syphilis, must always be excluded as a *sine qua non* before the operating.

He divides cases of mastoiditis into two classses, the first comprising those complicating acute aural disease; the second class, those complicating chronic aural affections. This division ignores primary mastoiditis, which is very infrequent.

The conclusions arrived at were: Operative measures should be instituted 1, to preserve the function of hearing as well as to prevent a fatal issue; 2, earlier in mastoiditis due to scarlet fever, diphtheria, and the worst cases of influenza than when due to colds, measles, typhoid fever, etc.; 3, in the acute cases of mild infection, when subsidence does not occur within at most eight days (Schwartze), but the shorter period is safer in a virulent infection; 4, recurrent mastoiditis due to any cause; 5, in mastoiditis complicating a chronic suppurative otitis; 6, in acute cases when there is a drooping of the lining membrane of the superior posterior wall of the external auditory canal, carrying with it the membrane Shrapnelli; in chronic cases when at the same place a crater-like opening leads to the recessus epitympanicus and aditus ad antrum, even though in neither case symptoms immediately menacing life be present.

The author favors the typic or original Schwartze method of opening the mastoid antrum. Its success in given conditions justifies its application; its failure in given conditions has resulted in a more perfect procedure styled the Schwartze Stacke, or radical operation.

Dr. J. HOMER COULTER of Chicago maintains that the general practitioner should not treat cases of mastoiditis in which the symptoms are well defined, and no one who has not had considerable surgical experience should attempt the Schwartze operation.

Dr. J. A. STUCKY of Lexington said that in many cases of necrosis of the malleus he has made a free incision along the posterior superior wall of the canal, curetted the diseased bone away, tamponned the canal lightly with iodoform gauze, and patients have done well without undergoing the radical operation.

Dr. DUDLEY S. REYNOLDS laid stress on the importance of instituting constitutional medication in the stage of invasion in cases of mastoiditis, saying that an ounce of prevention at this time is most preciously bestowed.

Dr. L. B. GRADDY of Nashville called attention to a point not mentioned in the paper—the differential diagnosis between mastoiditis and mastoid periostitis. If cases are carefully observed there is as much difference between the two conditions as there is between a periostitis of the tibia and an epiphysitis. This differentiation is of permanent importance in the treatment, whether it be medical or surgical.

Dr. J. HOMER COULTER of Chicago read a paper on

PROPHYLAXIS IN NOSE AND THROAT DISEASES.

He said that there are many preventable pathologic conditions in the nose and throat, and that many of the ordinary diseases of this portion of the anatomy have evoluted into more serious and distinctly different affections, will be admitted without question. He omits any reference to such conditions as syphilis, tuberculosis, diphtheria, influenza, or the exanthemata, inasmuch as the possible prophylaxis in each affection is a matter of general knowledge. He also omitted reference to any technic details which are at best mooted points with authorities.

Surgery does not cure all conditions, nor does it even prove always a prophylactic blessing. So also do local applications and constitutional treatment prove unavailing if universally depended upon. This is due, in a measure, to the lack of carefully exacting and eliminative diagnoses. With the development of our knowiedge of the physiology of the nose and throat, have come, also, new ideas of the connection between many diseases of those organs and of their relative etiologic importance. The impairment to ventilation and drainage is a most important factor, and one usually amenable to surgical treatment. "Taking cold" is not only a most frequent condition, but one the most susceptible to prophylactic measures. Clothing of the entire body is a factor of paramount importance in prophylaxis. Too much clothing about the head and neck is just as disastrous as insufficient protection. Adenoids, polypi, spurs, exostoses, deviations, deflections, and sensitive areas, are each amenable to surgical treatment, and demand such interference as soon as recognized. On the other hand, too much surgery is quite as disastrous as too much conservatism. The tonsils are the cause of other and reflex pathologic conditions as frequently as are adenoids. Mouth-breathing

should be recognized as a most significant danger signal. Anything which produces an alteration in the normal physiologic metabolism of the mucous membrane of the nose and throat; any alteration in the nutrition of the parts; any abnormal variation in functional activity; any considerable change in the histologic anatomy, are each and all remedial surgically or otherwise, and are, therefore, amenable to prophylactic efforts.

Dr. J. A. STUCKY of Lexington followed with a paper entitled

PERITONSILLITIS OR QUINSY: CAUSE AND TREATMENT.

Of ten authors consulted, seven, after citing hereditary predisposition, exposure, etc., mention rheumatism and gout as the most prolific causes of this malady. Close observation and careful testing in selected cases, convince him that the rheumatic, or more probably the uric acid diathesis, has more to do with the causation of this disease than any other factor.

Coming to the treatment, he believes, if the majority of cases of quinsy are seen within forty-eight hours after the first onset of the disease, they can be aborted to such an extent that suppuration will not take place. In cases that progress to suppuration, he strongly advocates early and free puncture, just as soon as there is marked distention, in order to relieve pain and stop the destructive suppurative process. For this purpose he uses a modification of an ear spoon, first described by Spier, and not a knife.

(To be continued.)

The Chicago Society of Internal Medicine.

Second Regular Meeting, Sept. 21, 1898.

(Continued from page 984.)

Dr. DANIEL R. BROWER read a paper before the meeting entitled

ACUTE CEREBRAL MENINGITIS: OBSERVATIONS ON ETIOLOGY, DIAGNOSIS AND TREATMENT.

Cerebral meningitis is, in all the large cities, a formidable cause of death. In some years it is surpassed by but few causes of death. The following table shows this, as well as emphasizes the fact that the ordinary therapeutic measures are of no avail:

DEATHS FROM MENINGITIS IN CHICAGO.

1860.	1	1891.	1,311
1865.	21	1892.	1,125
1870.	172	1893.	1,452
1875.	255	1894.	1,220
1880.	408	1895.	764
1885.	528	1896.	606
1890.	817		

These figures are much the same as those of other large cities, and show the necessity of a more careful study of the cause, prevention and treatment of this class of diseases. The cerebral membranes are favorably placed for the development of bacteria. At least nine micro-organisms have been found present, doubtless as causative factors in cerebral meningitis, as follows: Pneumococcus lanceolatus, diplococcus intercellularis, streptococcus pyogenes, staphylococcus pyogenes aureus, bacillus tuberculosis, bacillus of Eberth, bacillus coli communis, streptococcus seiferti and the gonococcus.

The classification of meningitis to be scientific should be based upon its causative, and it is therefore necessary to determine in each case the micro-organisms that may have produced it, and herein the difficulty lies. Lumbar puncture, and the chemic and bacteriologic examination of the cerebro spinal fluid obtained will enable, in some cases, a differential diagnosis to be easily made. This lumbar puncture is a trifling operation. It consists in passing a needle into the subarachnoid space between the third and fourth lumbar vertebræ in adults, or between the fourth and fifth lumbar vertebræ in children, about 5 mm. to one side of the median line. For young children the ordinary hypodermic needle is sufficient, for adults a larger and longer needle is necessary. The fluid obtained should be tested first for albumin, but in acute inflammatory conditions the amount is considerably increased; it may be 1 or 2 per cent. Then the examination should be made for pathogenic organisms, and when found the diagnosis is complete. The Skeer sign, if present, will enable a diagnosis of tubercular meningitis to be made very early. This sign was described by me in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Jan. 7, 1888, and observed by the late Dr. I. D. Skeer of Chicago twenty years before. It is due to the deposition of the tubercle around the pupillary margin of the iris. It shows itself first as a distinct wreath of white clouds about a millimeter from the margin (see Fig. 1). This sign occurs before any change has taken place in the pupillary orifice. After three or four days these minute, cloud-like masses disappear and a yellowish, round circle takes their place (see Fig. 2), becoming more attenuated as the pupil dilates. These secondary changes are doubtless due to degeneration of blood-vessels and tissues from the tubercular deposits. Unfortunately, this sign is frequently absent, but when present is pathognomonic of tubercular meningitis.

Treatment.—A dark, well-ventilated, quiet room should be found. The patient's should be shaved and surrounded by ice-bags; leeches should be applied over the temples, the pain should be mitigated by morphin or antipyrin hypodermatically, the temperature should be reduced by cold sponging, the bowels should be freely moved by calomel, and there should be applied freely to the scalp every day a 10 per cent. solution of iodoform. The difficulty of medicating these cases by the mouth, led me to adopt the treatment by inunction about fifteen years ago, first with mercury without any success, and then with iodoform with some success. Absorption usually takes place promptly, so much so that I have been able to detect the iodin in the urine and saliva one hour after inunction. The amount absorbed can not be very great, inasmuch as I have never seen the untoward effects that sometimes follow the use of iodin in open wounds, and I have used in the treatment of a case as much as ten grams of iodoform. I have suggested this treatment in consultations in at least a hundred cases, but have been able to get the results in the following cases only:

	No. of cases.	Recoveries.	Deaths.
Dr. J. S. Hunt (deceased)	8	6	2
Dr. J. W. Fitzmaurice	6	4	2
Dr. P. H. Conley	2	2	0
Dr. M. Leevenson	2	1	1
Dr. W. D. Neal	10	6	4
Dr. David O'Shea	7	6	1
Dr. William Martin	2	1	1
Dr. G. W. Reynolds	3	3	0
Dr. J. C. Craig	1	1	0
Dr. D. R. Brower	6	3	2
Total	46	33	13

In one of the cases that died in the practice of J. S. Hunt, and of the cases I have reported as terminating fatally, the Skeer sign was present, making the cases tubercular meningitis. In the other fatal case I have reported, lumbar puncture determined the bacillus tuberculosis to be present. The diagnosis in these cases was made by the attending physician and myself, and any one of those whose names appear in the list are perfectly competent to make a diagnosis. Indeed, there are none more so. Many years of practice and excellent scientific attainments are qualifications of them all. Some of these cases were exceedingly unfavorable, notably the case of Dr. Craig, that did not seem to offer the slightest hope of recovery.

I trust that this communication will result in a more general use of this plan of treatment in this perplexing class of cases, and that it may aid in diminishing the great mortality from meningitis found in our city health reports.

Dr. W. D. NEAL—It is a matter of surprise to me that Dr. Brower brings this question up this evening. I have not given the subject any thought for quite a while. These cases were given over the telephone, and I am not sure there was a correct understanding as to the remedies employed in all of them. If I remember correctly, two of these cases recovered where I did not use the inunctions. It was before I began their use. It may be possible that in one of these cases the diagnosis was not clearly made out. The percentage of recoveries given here looks high, and the same ratio might not have been maintained if carried farther. There were other elements brought to bear in some of these cases which I thought cut quite an important figure; at least, I put a good deal of stress upon the minute doses of calomel, particularly in younger children. It might have been the inunctions, but I have a good deal of confidence in minute doses of calomel often repeated. I do not know how it acts, but I am sure I have had good results from the use of the inunction and calomel combined. I have not kept any data of my cases since talking to Dr. Brower, and I am inclined to think that the percentage of recoveries has not run so high, but I have come to the belief that the disease is not necessarily fatal, and that the mortality can be greatly reduced by this method of treatment.

Dr. M. L. GOODKIND—I should like to ask if there are not a great many cases simulating meningitis that occur in infectious diseases, particularly in children, such as pneumonia, and intestinal toxemia, which get well spontaneously with the subsi-

dence of the malady producing the meningeal symptoms; cases of opisthotonos with convulsions and general rigidity, with contracted or dilated pupils—cases that can not be called meningitis, although they closely resemble it. Possibly that may be an explanation of some of the cases recovering under calomel and iodoform inunctions.

Dr. SANGER BROWN—I would like to briefly call attention to one aspect of this subject, and that is regarding the differentiation between pseudo-meningitis and acute meningitis. I think this is a point which frequently perplexes the practitioner, and one on which we would like some light. It often happens to those of us who do some consultation work to find that between the time the practitioner decides to call a consultant and the time at which the consultant arrives the symptoms will have sufficiently declared themselves in one way or another so that then it is comparatively easy to make a diagnosis.

It must be admitted that in a great many conditions, especially in children, it is impossible to determine, often for many hours, whether we have to deal with a case of pseudo-meningitis or a case that will afterward become an undoubted acute meningitis. I think we are warranted in the assumption, now that it has been discovered and pretty well demonstrated that so many different kinds of bacilli are competent to act upon the meninges and produce meningitis, that the symptoms that we get in many of the infections are probably due to the action of a bacillus or bacilli upon the meninges, and that, as the process advances, there is a concentration of the bacilli to some place or organ for which they have a greater affinity, and the meningitis aborts, so to speak. I think this is a more rational view to take of the subject than to assume that the pseudo meningitic symptoms are due always to the action of a morbific influence in some remote part or organ, that is, to reflex action.

I was struck forcibly with this recently in consultation where there were at first marked symptoms of pseudo-meningitis, which disappeared in the course of a few days, and pronounced symptoms of acute anterior poliomyelitis declared themselves. The attending physician, who was a very competent man, and had of course seen a great many cases of actual meningitis in his practice, felt sure that he had to deal with a case of this disease. There was well-marked opistbotonos, vomiting, and constipation lasting for a day or two, when the mother, who was herself the daughter of a physician, noticed that the child was not using the lower extremities and one arm as much as she thought it ought to. In the course of a day or two all the pseudo-meningitic symptoms entirely disappeared, and when I saw the case, ten days later, it was one of well-marked acute anterior poliomyelitis. Now, we have every reason to believe that acute anterior poliomyelitis is due to infection, and we know that acute meningitis is so caused. I think this hypothesis is well worthy of our consideration, and it derives further support from the fact that as a general rule, in cases of patients dying from actual, well-marked attacks of acute meningitis, in quite a large proportion we find very much less evidence of disease macroscopically in the meninges and cortex than we should have been led to expect, and yet we can have no doubt that the action of these microbes upon the membranes and cortex produced the meningitic symptoms. I repeat, then, that it is not a difficult matter, at least according to the view I take of it, to infer that many of the symptoms in so-called pseudo meningitis are actually due to the action of bacilli upon the meninges and cortex, and that they rapidly subside, either by destruction of the microbes that caused them, or that these abandon the meninges and concentrate in some other part of the economy, giving rise to this or that type of infectious disease.

That shock, however, caused by intestinal irritation or extensive superficial burns, for instance, may excite convulsions in children, must be freely admitted.

Dr. R. B. PREBLE—The thing which impresses me most in this report is the wide difference between it and the mortality which we are led, both by our reading and experience, to believe prevails in meningitis. If we take from the table the 4 cases which are admitted to be tubercular, we have 42 cases with 33 recoveries; that is, a mortality of 25 per cent. for a disease which all authors agree is almost invariably fatal, with the exception of meningitis which is classified as epidemic, and even in this form the mortality ranges anywhere from 80 to 20 per cent., the cases toward the end of the epidemic being milder, and averages about 57 per cent. We must, therefore, be strongly impressed by a report in which the mortality is about 25 per cent., especially when we consider the fact that the therapy has undergone no radical change; we have here nearly the same therapeutic measures which have been employed for years and which have been, not given up, but regarded by most authorities as having little more than a palliative effect.

There are a great many conditions which simulate meningitis, nephritis for one, it being not uncommon for uremia to simulate meningitis, and the differentiation can be made only by an examination of the urine or a postmortem, in which the brain will be found in a normal condition or showing but little hyperemia or edema. Another condition, which frequently gives rise to such meningeal symptoms, such as isolated paralysis of the ocular muscles, can occur from sepsis, just as it can occur from nephritis. Personally I have seen a number of cases which clinically closely simulated meningitis, the simulation going far enough to pick out separate eye muscles, separate cerebral nerves for paralysis, but postmortem showed the cases were not meningitis. I have seen other cases which I believed were meningitis that recovered, and I could only say that I was not certain. I have only seen one case where I was sure that it was meningitis. That case I saw recently in Dr. Butler's ward at the County Hospital. The man gave the usual initial history of meningitis, facial paralysis, choking of both discs, pure culture of the meningo-coccus from the fluid gained by lumbar puncture, and yet he recovered. I feel reasonably sure that in this one case I saw meningitis recover. There are a few cases of tubercular meningitis in which recovery has taken place. Eiham records one case of recovery after lumbar puncture with demorstration of tubercle bacillus. Eichhorst has one case. Luebe had one case, and Koliako of Vienna had a case.

In view of the wide difference between Dr. Brower's results and the general opinion of the mortality of meningitis, we must demand more accurate details of the individual cases, before we can accept this table and before we can adopt the use of the iodoform inunction with any confidence.

Dr. H. M. LYMAN—More than thirty years ago I had from the late Dr. Bevan an interesting pointer in regard to meningitis. I had a little patient whom the year before I had rescued from death by furnishing a wet nurse when he was starving, under the care of a homeopathic physician who did not believe in wet nurses, consequently I felt a good deal of interest in the case. After recovering from the perils of lactation and early dentition, he was finally attacked with symptoms which I attributed to tubercular meningitis. The classical symptoms were all present and I had no doubt of the result. I called in Dr. Bevan, who suggested that it might be pseudo-meningitis and was probably due to some disturbance of the digestive organs. He advised the use of small doses of calomel with tincture of belladonna, and in a few hours the photophobia, the irritability and other evidences of meningitis subsided and in a few days the patient made an excellent recovery. Since then I have seen a number of such cases, and I think it would be well for us to recall to mind the fact that the onset of very many diseases, especially with children, is apt to be exceedingly severe and that many cerebral symptoms are prominent which would lead us to believe that they are really due to congestion of the meninges, and yet it will all clear up in a short space of time, with or without treatment. So in analyzing a table of this kind, for the city record, especially, I think it would be desirable to have an accurate statement and description of the characteristics of the cases before we decide as to the results of any form of treatment.

With regard to the symptoms involving the iris, I used to see some of these cases with Dr. Skeer. It was his belief that they were due to local tubercular deposit but I was never able to discover anything of the kind, the appearance depicted in the iris appeared to me to be due to effusion of an inflammatory character. When tuberculosis involves the eye, tubercle is usually deposited in the choroid and does not manifest itself in the iris. I am not able to find any description of tubercle upon the iris, but this peculiar formation in the iris is not so very uncommon, and is a very interesting symptom when present, though by no means as diagnostic as Dr. Skeer was led to believe. In those days the matter had not received attention and been described in the books as it now is, but now it is a well-known symptom. So far as the treatment is concerned in tubercular meningitis, you must rember that recoveries occasionally occur, but it has long been noted that patients who are supposed to recover from tubercular meningitis are liable to returns of the disease. Certain foci of tuberculosis in a distant part of the body perhaps, would disseminate tubercular germs and there would be a temporary inflammatory condition lasting for a time, the patient apparently recovering from that, then there would be another scattering of seed upon susceptible soil and another attack, which usually proves fatal. So where there is reason to believe that there is tubercular meningitis temporary improvement or apparent recovery should not lead us to flatter ourselves that recovery has actually taken place, any more than in tuberculosis of the lungs where a tubercular focus having formed giving rise to symptoms which

have subsided, should lead us to suppose there is a final recovery; it is simply a stage in the disease. Tubercular meningitis is almost invariably fatal in the first or second attack. So far as the disease Dr. Brown has alluded to as pseudo meningitis, is concerned, connected with spinal disease, it is a well-recognized fact and I have seen a number of cases of the kind, that the onset of true poliomyelitis is attended with a violent reaction of a similar character, the disease frequently in its onset resembles clinically the ordinary form of spinal meningitis. I have not seen a case resembling tubercular meningitis, but I have seen cases resembling epidemic spinal meningitis in the early stage, then points of differentiation appear so that finally the diagnosis is cleared. So far as lumbar puncture is concerned, that is advisable as a means of investigation in asylums and hospitals where you can treat your patients as so many blocks of wood, but in private practice it is almost out of the question, and I think it would be advisable to reserve that method of investigation for selected cases. I should not recommend it to be employed in general practice, for with such treatment you would lose a great many patients. The result is uncertain, as has already been intimated, and you may make a puncture and get one kind of microbe, while another form that is producing fatal results will pass undetected. So with regard to the treatment of the disease this much may be said: that in the worst forms of tubercular and epidemic cerebro spinal meningitis there is no remedy that is of much value. You can palliate, but you will rarely succeed in curing. In the milder forms of the disease there is more hope. The patient dies from the poisonous toxins that circulate through the fluids of the body, therefore, if the kidneys are active, if the liver is efficient; there will be a better chance of recovery. Calomel is a positive diuretic, it does stimulate the action of the kidneys, it stimulates somewhat the action of the excretory functions of the biliary organs, and furthermore it intensifies the activity of other remedies. As for iodoform, a patient with a shaven head daubed with ointment produces a very imposing effect upon the bystanders, but so far as its absolute potency in curing the patient is concerned it is very doubtful. Its use has been pretty generally abandoned in the European hospitals where it has been tried.

Dr. H. T. PATRICK—Ever since I was an interne in the Infants' Hospital in New York, some fourteen years ago, I have been slow in making a diagnosis of meningitis. We had a lot of babies, and unfortunately a lot of deaths, as I remember—about a thousand a year. Most of these were posted, and it was startling to see the almost uniform absence of meningitis on the postmortem table, as contrasted with the apparent frequency of meningitis in the wards. It is a fact that is always recognized, but seems to be never quite comprehended that there is hardly a disease children have that will not produce the symptoms of meningitis. I have seen all the principal signs of meningitis in acute follicular tonsillitis, in pneumonia and gastric trouble, and there is a whole group of cases of pseudo-meningitis without apparent cause—a group the French call meningism. In other words, I would say that pseudo-meningitis is enormously more frequent than true meningitis. Every little while I see a case of cerebral paralysis, for instance, in which a diagnosis of meningitis was made by the attending physician at the time of the attack, and held to for a considerable time subsequently. Like Dr. Brown and Dr. Lyman, I not infrequently see cases of poliomyelitis that at the inception were very much like meningitis, and were so diagnosticated. I do not mean, for a moment, to cast a shadow of doubt upon the diagnostic ability or medical acumen of the gentlemen quoted here this evening, but I would like to emphasize a caution that it is almost too easy to make a diagnosis of meningitis. In the little consultation work that comes to me in this direction, I much more frequently have to say, "No, I think it is not meningitis," than to say, "I think it is." The symptoms of general toxemia arising from any sort of infectious disease in children are so prone to manifest themselves by cerebral symptoms, and if we have two or three or four striking cerebral symptoms and the patient is very low, it is so easy to say meningitis, when really there is no adequate foundation for such a diagnosis.

Dr. DAVID O'SHEA—Taking it for granted that Dr. Brower's treatment for meningitis is now recognized as the most valuable treatment within our knowledge, there can be no doubt in my mind that Brower's treatment possesses very many advantages which are not possessed by others. Lumbar puncture and Skeer's sign, with a good deal of experience, is a condition that will make a clear diagnosis of meningitis. This method will certainly exclude pseudo-meningitis diagnosis.

Treatment is simple yet very effective, administered as follows: Locally, after shaving the scalp, the following combination is applied: Lanolin et iodoform, 10 per cent., three times, daily; ice continually in cap; dark room; plenty of fresh air; free bathing; diet: milk, soups, icewater and fish. General treatment: potass. iodid and ammo. bro. Local treatment as previously stated.

The following cases consulted with Dr. Brower:

Case 1, in 1894, female aged 3 years, sick six weeks, recovery perfect.

Case 2, in 1894, aged 3 years 6 months, sick nine weeks, perfect recovery.

Case 3, in 1894, aged 4 years, sick seven weeks, fully recovered.

Case 4, in 1894, male, 2 years of age, sick eight weeks, recovery perfect.

Case 5, March and April, 1898, 1½ years of age, female, sick nine weeks, recovery perfect.

Case 6, 1898, male, 3 years, sick seven weeks, recovery perfect.

Case 7, 1898, female, 5½ years, sick seventy-one days. Hereditary tuberculosis. This case broke my record. I had all hopes of her recovery until the tuberculosis condition exhibited itself in miliary tuberculosis, complicated with acute nephritis. Previous to Dr. Brower's treatment my success was limited.

Compared in percentage to the recoveries: Brower's treatment, recoveries, 86⅔ per cent. Previous treatment: digitalis and belladonna was my anchor sheet, but failed in percentage of recoveries. In eight previous cases, 56 per cent. of recoveries.

To find the good effects of Brower's treatment, you will find iodid in the urine three hours after application. I hope Dr. Brower's success will continue.

Dr. D. T. NELSON—This discussion comes very close home to me, as I have had three cases in my family of what I called cerebro spinal meningitis. Two died and one recovered. The worst case got well. The little girl was 1½ years old at the time of the attack; the whole duration of the disease was perhaps six weeks. The baby was born nine days before the great Chicago fire. She was seen by our best physicians. I am not sure that Dr. Lyman saw her, but the elder Davis and the elder Byford and Roler did, and like myself, they supposed she could not recover because it was tubercular meningitis. To give an idea of the severity of the case, the child was ten days without winking, and as she recovered scales fell from her eyes. I do not know whether it was simply dried mucus or whether they were portions of the cornea. I supposed she would never see, but she sees as well today as any one. She likewise hears as well as any one, and has had no nervous disturbance since except chorea at the age of 10 or 12 years. She recovered completely from the chorea; she was loaded with strychnin until she fell down stairs, but whether the fall was due to the strychnia or the chorea I do not know. Strychnia was pushed till there was rigidity of the muscles of the face and jaws. Her mother said she should not take any more strychnia, and she did not, but she had considerable chronic symptoms afterward. I am not familiar with the iodoform treatment; that has come up since I have had much to do with these cases. There was one remedy, a sheet-anchor in my day, in the treatment of these cases, and that was repeated blisters; as one healed it was repeated, and it did more to save lives than anything else in my belief, provided the patient could take nourishment. I believe that was what saved this patient; she would take beef tea and milk, all that was given to her, and that was in large quantities. The trouble was with respiration and the heart's action. There was no trouble fortunately with deglutition. The respiration was slow; it would stop entirely sometimes for minutes. Once I went to the drug store to get a supply of medicine and they sent word that I need not bother about it as the child was dead; she had stopped breathing, they supposed, so long that she must be dead, and with reason, except she did not become pale. The child had received enormous doses, for her age, of digitalis and belladonna, and if any internal therapeutic agents saved the child it was these. For external applications she had blisters.

By the advice of William H. Byford I once placed a blister on the forehead. We believed the case to be tubercular meningitis, and therefore expected a girl of 12 to 14 years would die. Our patient did die. We should give as little morphin as possible. I am a great believer in calomel. I remember at that time I was consulting everybody, and one physician said, give diuretics; let your sheet anchor be diuretics, as potassium acetate; that is, if there is sufficient vitality in the nervous system to aid your remedies in producing their usual effect; if the system is not completely paralyzed by the disease, excretion is the desirable thing. But the cases vary. I remember in one of the early epidemics a leading dentist

here died with what was believed to be cerebro spinal meningitis after an illness of thirty six hours. I think we will always find that in the early cases of an epidemic the mortality is much greater than later, but it may vary from 100 per cent. to almost nothing.

One symptom has not been spoken of tonight, although it is recorded in the older books, namely, the spotted character of the skin, which was well marked in my severer cases.

The first case I ever saw was in the army, soon after the surrender of General Lee, in the U. S. Post Hospital of Richmond, Va. The disease was quite prevalent in the army at that time, and was called spotted fever. The spots were well marked, as large as the finger-nail and as small as a split pea, due doubtless to paralysis of the cutaneous vessels.

To return to the blister, it seems to me from a study of physiology in former years, that if one hand be put in ice water and a reduction of temperature be shown in the other, there is something of reflex action, though I see it decried now by many neurologists. It seems to me a blister can and does have some effect. Bromids and ergot were then used freely in the early stages of the disease, and later, when the evidences of effusion and paralysis appeared. Iodid of potassium and diuretics were substituted, but blisters were continued until complete recovery took place.

My little baby boy, who died at the age of four months, June, 1874, of cerebro-spinal meningitis, in the stage of effusion, was the first case that I ever saw or heard of where the lateral ventricles were tapped by the Dieulafoy aspirator, which was then beginning to be used. It was done by Dr. H. A. Johnson at my earnest request, as he feared the child would die during the operation. It was done through the anterior fontanelle, and about an ounce of serum removed, and while the baby rallied for a time, it died in some twenty-four hours from the reaccumulation of the fluid. Although electricity was freely used, the child died from failure of respiration and of the heart's action.

Dr. ARCHIBALD CHURCH—I am glad to be made familiar with the ocular sign in meningitis, and in the same connection I would like to call attention to the sign mentioned by nearly all writers on the subject, but which is rarely sought for in practice—the sign of Kernig. It is due to the tendency to rigidity, and is elicited by straightening the leg upon the thigh flexed to a right angle with the trunk, as in the sitting posture. In the great majority of cases a certain amount of contracture will be demonstrated in the flexors of the knee before nuchal retraction appears. I have found this so constantly present that I look upon it as of extreme value.

In a recent very comprehensive article by Councilman, published by the State Board of Health of Massachusetts, and based upon the examination of a large number of cases occurring in Boston during the past two years, the statement is positively made that in all of the epidemic forms of cerebro-spinal meningitis the meningococcus of Weichselbaum was found. He asserts that it is the essential organism in the epidemic form, and also suggests that a test of the nasal mucus in cases of epidemic meningitis will often lead to the detection of the meningococcus, thereby serving to establish the diagnosis. A recent contribution in German literature, however, would give the negative to the assertion as far as the nasal secretion is concerned, because in a large number of cases where no meningitis was present, the meningococcus was found in the nasal secretions. This, however, gives us an idea how infection occurs when the nasal vault or the internal ear is ruptured by fracture. When Councilman presented his topic before the Johns Hopkins Hospital Medical Society, Welch, who had a large experience in the epidemic form from the material presented by Barker and Flexner, took the ground that very likely the meningococcus of Weichselbaum was one stage of the pneumococcus, which he had found invariably in the epidemic at Lanaconing. He was not willing to assert this, but thought it might be the case.

The relation of meningitis to pneumonia is one of great intimacy, as has been emphatically pointed out before this society by Dr. Wells, and this table presents the same fact. You will notice meningitis appeared to attain its greatest frequency in 1891 to 1894 and 1895, years when grippe was prevalent, and grippe, pneumonia and meningitis are almost interchangeable terms, as we know from clinical experience. Pneumococcus meningitis is almost invariably fatal, while the meningococcus form presents 15 to 50 per cent. of recoveries. If we can detect the micro-organism we have a prognostic help. Lumbar puncture, if giving positive findings, is of some value. In a case under my care some years ago at St. Luke's Hospital, lumbar puncture carefully performed several times was negative, at the same time the head was markedly distended. It was an infant and the fontanelles were still open and bulging. I subsequently punctured the lateral ventricle through the lateral angle of the fontanelle, and secured a large quantity of fluid which presented the pneumococcus in large numbers. The child died, and a section made by Dr. Eisendrath, showed that there was in addition a tuburcular meningitis—a rather rare mixed infection. I think lumbar puncture should be carried out as a routine measure, and as a diagnostic measure has value, but as a therapeutic measure it is of slight importance. Jacoby of New York has suggested making an opening into the ventricles through the skull and dura, in conjunction with lumbar puncture, for the purpose of washing out the intradural spaces. By making such openings the entire field could be irrigated. He also advises that iodoform be used in making the flushings. I have used iodoform inunctions as recommended originally in Germany, in a number of cases, and like Dr. Neal, have associated small doses of calomel. I am indisposed to give up the calomel, feeling that it may act as a germicide, perhaps, or counteract in some way the toxic effects of the germ activity, besides increasing elimination through bowel and kidney.

Dr. D. R. BROWER, in closing the discussion, said: I am very pleased that this communication of mine should have produced such an interesting discussion. I am very much obliged to you for the attention you have given it and I am very grateful that there is some disposition to investigate it and to induce further investigation. I would not have dared to come to this Society and tell you that I knew of 46 cases of meningitis with 33 recoveries; I would have been annihilated if I had done so, but I brought with me the names of medical men who ought to know, if they do not, how to diagnose and investigate some of these cases. I saw most of these cases but I will not father them all. These observations began some ten or fifteen years ago. I do not believe these cases were pseudo-meningitis—I do not believe they were intestinal reflex irritation, I believe they were meningitis. Dr. Neal is sure his cases were meningitis and not pseudo-meningitis. The value of the therapeutic measure is the persistent use of 10 per cent. inunctions of iodoform with lanolin to the shaved scalp, thoroughly applied, and in an hour we can find the iodoform in the urine or in the saliva. The system is saturated with iodin and I believe that iodin is a germicide. Calomel was given to most of these cases one time or another; constipation characterized the majority of them; they vomited castor oil, and calomel had to be given as the agent that would produce a laxative and a diuretic effect.

As to the Skeer sign, Dr. Skeer, some fifteen years ago, first called my attention to this. The first case he observed was a member of his own family who died of tubercular meningitis, and in another case occurring in his own family, the same sign was present and was verified postmortem. He called my attention to this sign in a case I saw with him in consultation. In that case the result was verified postmortem, and in two other cases in which this sign was present the result was verified in the same manner. So I know of four cases in which this sign has been verified postmortem. Of course that is not very many. It is not present in all cases of tubercular meningitis. If it is present in any other disease I have never seen it. It is the first stage only of this sign that is easily diagnosed. The reason I seldom see it in consultation is that I am never sent for until it is pretty nearly extinguished. When the case is about to die the consultant is sent for in order that the case may go *secundem artem*. I would suggest, as Dr. Moyer has suggested, that there might be some positive investigations along this line and I hope the members of the Society will attempt to cure this disease by iodoform inunctions. Use calomel all you please, and properly selected means of reducing temperature locally and generally, but give iodoform inunctions a trial and let us, a year hence, give this subject further consideration. I would be glad to have the members of the Society communicate their investigations. I believe the Skeer sign is pathognomic of meningitis. I do believe that some cases of acute meningitis are modified in their course, possibly aided to recovery by inunctions of iodoform and lanolin.

San Francisco County Medical Society.

Dr. HARRY M. SHERMAN presented a paper entitled

FAULTY UNION IN A FRACTURE OF THE FEMUR; RESECTION, AND UNION IN GOOD POSITION.

The history of the case reported was as follows: The patient, a young woman of 18 years and 10 months, had fallen when a child of 8 and struck on her hip, since which time, or for over ten years, she has had a limp, rendering locomotion almost impossible, and has suffered considerable pain. The fall occurred during an epileptic seizure. At that time she was confined to the bed for a week only, the trouble not being consid-

ered grave at first; it subsequently became worse. She had not been able to stand on the right leg, the one affected by the fall, for ten years. A few months ago she fell again, striking her knee; there resulted some soreness of the knee, but no trouble with the hip. The patient, at the time she presented herself at the University of California clinic, was exceedingly fat, so much so as to prevent her from walking almost entirely, for she could only with great difficulty and for a short time use crutches. On examination she exhibited 20 degrees of adduction, and the greater trochanter was 5.25 cm. above Nelaton's line; owing to the excessive fat the diagnosis could not be exactly made out, but seemed to be a posterior dislocation of the head of the femur. The possibility of an intracapsular fracture was discussed, but was not held to be very probable. There had been no epileptic seizure for some years. The right leg was flexed 40 degrees, and had the characteristic appearance of a posterior dislocation. The girl was sent to the Children's Hospital, where it was decided to operate for the reduction of the dislocation. An incision after the method of Lorenz was made, the proper muscles divided, and then, when the finger was introduced, the head of the femur was found to be in the acetabulum. Forcible traction was made, resulting in a prompt fracture of the neck of the femur, at the site of the old fracture. A gauze drain was introduced, the limb bandaged and fixed with some considerable abduction. The operation was made August 14, and the patient was up October 20. Shortly after first getting up she had an epileptic attack and was placed upon bromid as an article of diet. She was discharged from the hospital with instructions to use for two weeks, two crutches; for two weeks, two crutches in the street, and one in the house; for two weeks one crutch in the house and a crutch and a cane in the street; for two weeks a crutch in the street and a cane in the house; for two weeks a cane in the street and nothing in the house, and after another two weeks to use no artificial support either in the house or out of doors. At the end of three months the patient was again seen, and at that time she had a slight amount of adduction, but walked well without any assistance. She was seen still later, and the result was very satisfactory. There was considerable fibrous anchylosis, but little motion at the hip joint, yet she could walk well and had no pain. Dr. Sherman urged that operative interference be more often resorted to in those cases of intracapsular fracture of the neck of the femur which were not impacted; where there was impaction, interference was not needed, but he urged that many cases of this fracture in old people might be very markedly improved by operation somewhat after the method he had employed. Dr. Sherman also exhibited Grattan's osteoclast, recently devised for the more satisfactory refracture of bones. He illustrated its manner of easy adaptation to almost any bone or region, and dwelt upon the fact that with this instrument it was possible to fracture the bone by means of what was practically a blow and not merely a crushing; consequently it gave a much cleaner fracture than could be obtained by other devices, and the fracture was always at a known point, opposite the descending jaw, or "jack," of the instrument. He had that day used the instrument on two legs with eminently satisfactory result. He also exhibited some photographs and skiagraphs of a case of arthritis deformans of both knee-joints, which was remarkable for the amount of deformity, and the fact that apparently the man ought not to be able to walk with the amount and extent of deformity present. The knees, especially the right, were so much disturbed in their relations that the inner tuberosity of the tibia was exactly over the external condyle of the femur. Yet the man could walk easily and had very little limit to the proper motions of the joint. He had applied to the University of California clinic for a brace to relieve the tendency of the leg to spring outward in walking, due to the improper location of the strain caused by the deformity.

Dr. KENYON said that he recalled a case he had operated upon many years ago, for relief from the deformity resulting from a fracture of the femur. He had operated by sawing through the femur between the greater and lesser trochanters, and the result had been excellent, the patient being some years afterward killed while she was riding horseback, thus showing that she had improved sufficiently to take such exercise.

Dr SHERMAN said, in reply, that his case was one of intracapsular fracture, and that the operation had been an intracapsular fracture, and not a subtrochanteric osteotomy, as was the case with the patient reported by Dr. Kenyon. He urged that these cases of non-impacted fracture be operated upon, being strongly of the opinion that the results would be very much better than at present if this was done.

Dr. WHITNEY said that he had recently seen two cases of intracapsular fracture of the neck of the femur, in both of which there had been crepitus and every evidence of non-impaction, and yet both of the patients had refused to remain in bed, and had gotten up almost immediately after the accident. Both were doing well and walking around with very little discomfort. One was a woman 82, and the other a woman 85 years of age. Certainly there would have been nothing gained in these cases by operating. He asked what explanation Dr. Sherman would make of the fact that these women were so soon walking about, apparently with a perfectly healed fracture of the neck of the femur, where there had been no impaction and no operation.

Dr. SHERMAN answered that he thought the patients mentioned were probably walking on the capsule, and that there had not been bony union of the fracture. He did not believe that bony union ever occurred in cases of intracapsular fracture of the neck of the femur in old people. It was a question entirely of the nourishment of the upper fragment, and the nourishment was so trifling, without impaction, that he did not believe it possible for true bony union to occur. For that reason he was extremely careful in examining all cases of suspected fracture of this region, not to use any force; he never made the examination under chloroform, and never manipulated the leg at all forcibly. If he could not easily determine the condition he much preferred to await developments rather than to use force and run the chance of breaking up an impacted fracture.

Dr. NUSBAUM presented a report of a case of

CONGENITAL DEFORMITY.

He had hoped to be able to present the case to the society, but, unfortunately, it had some days previously developed bronchitis which proved fatal very suddenly. At birth the case presented the following appearance: The right radius was absent; the hand was clubbed; the thumb, which was perfectly developed, hung by a mere thread from the hand, the right ear was bent forward, and in front of it was a tit of skin, sharply pointed; near the umbilicus were two hernias; there was right facial paralysis. The child had been born on Jan. 17, 1898. It was the fifteenth child of the parents; the father was a confirmed drunkard; the mother was apparently healthy; six of the fifteen children are living and all were normal at birth. The birth of the present one was normal and no forceps were used. The mother stated that she had fallen four times while carrying the child, and it was probable the husband had abused her during the period of gestation. The husband had applied to the doctor during the pregnancy for some ergot, expressing his desire to produce an abortion; it was not supplied by Dr. Nusbaum, but the man may have obtained it from some other source. The Doctor then cited a number of authors on the subject of multiple deformities, and stated several theories.

Dr. HUNKIN said he did not think that external violence could have produced the deformities described; he was rather inclined to believe that the condition of the thumb and the absence of the radius might be explained by assuming an incomplete intra-uterine amputation, from the cord having encircled the arm. Dr. Kerr asked if there were any rudiments of the radius and it was stated that there were no rudiments; that the radius was totally absent.

Dr. KERR then said that he thought no pressure or external violence could have produced the trouble, nor yet that it could have been caused by uterine amputation, for in either of these cases there would have been some trace of the missing bones. He mentioned some statements which he had seen in a medical journal, the writer of which he could not recall, which were to the effect that in a number of cases where these multiple deformities had occurred, alcoholism could be directly traced as the probable cause. One case in particular was mentioned in which the conception had commenced when the father was quite intoxicated; other children by the same parents, but which had been conceived when the father was sober, did not show any deformities at all.

Dr. HUNKIN mentioned several cases which he had seen, but in which the radius was missing from both arms, and not only from one, as in this case; he felt that alcoholism could be eliminated from the cases he mentioned.

Dr. SHERMAN stated that he thought the condition of the thumb was the result of an incomplete intra-uterine amputation, as has been suggested, no matter what the cause of the other abnormalities might have been. As to the statement that the radius was totally absent, that he thought could not have been made with absolute certainty unless the case had been skiagraphed, which had not been done in this case. He did not believe it possible to be absolutely sure of the absence of any bone, without the aid of the X-rays. He mentioned several cases which he had had the good fortune to see, one of which was the child of apparently, perfectly healthy parents.

Two children had been born, both of them normal and healthy; the parents were abstemious, the father not drinking at all, and he thought not even smoking. Yet there had been many deformities in the third child. It had been brought to him to see what could be done. He refused to make any statements or attempts at treatment until the child had doubled in weight. It was then again brought to him, and a careful examination revealed double club-foot, double club-hand, rachitic deformities, and a peculiar condition of the knees. Both knees were much deformed; the tibia on both sides was riding upon the femur, and there was absence of patellæ, with hyper-extension. He applied constant traction, till the tibia was drawn down to a point where it just rested on the femur; no amount of strain would, however, cause it to descend into place. The child had sickened somewhat in the hospital, and he had sent it away to the country, but would later on make further effort to improve the very unfortunate condition of affairs.

Dr. Nusbaum said, in closing, that he was quite sure that there was no radius in the case he had reported; several physicians saw the case, and they were all of the same opinion.

Cincinnati Academy of Medicine.

Regular Meeting, October 17, 1898.

Dr. Ricketts made a supplementary report to a case of "Ununited Fracture of the Middle Third of the Left Humerus," which he had first reported to the Academy in February, 1898. This fracture had been but one of numerous injuries, there being sustained at the same time both maxillary and Potts' fractures. The case had been operated on when it was found that union was not taking place. A long external incision was made, the ends of the bone freshened and brought in apposition with a single piece of silver wire. Unfortunately, erysipelas set in and involved not only the wound of incision, but spread over the arm, shoulder, chest and back, neck and face, and downward involving the buttocks. Two months afterward his fracture was still not united. The arm was not put in any kind of casing. Whether the effect of erysipelas causing great irritation about the non-united pieces, or what not, at any rate when he began to recover from the debilitating effects of his erysipelas, the ends of the bone began to knit, and now he has almost perfect use of the arm with but a minimum of shortening. The Doctor, in investigating the source of the erysipelatous attack, found that the patient himself had had the disease but a few months previously. It is interesting to note that previous to the operation the patient had but little or no use of his forearm and fingers. It was found during the operation that the median nerve had been caught between the fragments and more or less lacerated. Release of the nerve was eventually followed by perfect use of the muscles supplied by it. The man is 58 years of age.

The second case reported by Dr. Ricketts was one of epithelioma of the nose, almost centrally situated. He had burned away the diseased portions with a caustic paste, and had performed a plastic operation, pushing the flaps from the cheeks and using the septum nasi as a sort of beam for their support. This was three years ago, and while during that period he had been compelled several times to remove recurring nodules, the present result may be looked upon almost as a cure.

Dr. Robert Sattler reported two cases of myopia of high degree. In one, a young woman, the exact degree could not be exactly determined, owing, probably, to dioptric as well as axial astigmatism. The best vision obtainable was $^2/_{10}$. Treating each eye separately, he first established a traumatic cataract, removed the lens, and by a number of discissions established a clear pupil. Fourteen operations were made in all. Now with slightly plus glasses she is able to read the finest print. In the other case, a young man, the myopia of each eye amounted to sixteen diopters. Only one eye has as yet been touched, and a traumatic cataract is very evident. The Doctor expects by removal of the lenses to take away from nine to twelve diopters from the myopia, so that the boy with a concave glass of from seven to four diopters may have fairly good vision.

Dr. Sattler then read the regular paper of the evening, entitled "Recent Advances in Ophthalmology of Interest to the General Practitioner." He first called attention to the modern hope of restoring comparatively good sight in patients afflicted with high-grade myopia, not rapidly progressive, nor connected with serious damage to important structures, as liquefaction of the vitreous and detachment of the retina. The case he exhibited was but one of a large number, both in his own and in the experience of others. The method was first the formation of an artificial cataract by means of carefully guarded traumatism; the removal of the cataract thus formed, followed by discissions in sufficient number to establish a useful pupil; or the removal of the non-cataractous lens—an operation attended with slightly increased danger.

He then took up the subject of senile cataract, and the actions of the numerous charlatans who advertise its removal without the use of the knife, their method consisting in instilling into the eye a collyrium of any mild combination, usually with boracic acid, and following this up with massage, which massage could only be administered by the advertiser himself. The relief—never cure—occasionally obtained, the speaker ascribed either to the imagination of the patient, or to the lenticular myopia sometimes occurring in old age, presenting the well-known phenomena of second sight. Complete relief from any lenticular opacity could not be brought about without operative procedures.

The third point to which he called attention was the care of the new-born infant's eyes as a prophylactic to blenorrhea neonatorum. He recommended that in all hospitals and public institutions, among the lower classes of society, and in all infants in whom a possible infection was even suspected, there should be immediate disinfection of the conjunctival sac according to the method of Credé: the careful and proper use of a 2 per cent. solution of nitrate of silver, not dropped into the eyes, but with the child's head between the obstetrician's knees, with proper cleanliness especially of the hands, with the lids everted; a thorough brushing to be made, followed by the washing away of the excess of silver solution with sterilized water. If the silver solution were merely dropped into the eye, a severe traumatism of the cornea might result, which might be followed by the direst consequences. He also stated that while specific gonorrheal infections were undoubtedly the most virulent, any purulent ophthalmia at this very early period of life would probably result seriously as far as ultimate vision was concerned.

Discussion was by Drs. Christian, Caldwell, Johnston, Jones, H. M. Brown, J. Louis Brown, Judkins and the essayist.

PRACTICAL NOTES.

Ichthyol in Variola.—A writer in the *St. Petersburg Med. Woch.* of August 20, extols his remarkable success in variola with 20 per cent. ichthyolized collodium, which he had found very effective in herpes zoster.

Mentholised Iodol.—The addition of 1 per cent. menthol to iodol disguises the odor while enhancing the therapeutic effect in nasal and laryngeal troubles.—*Klin. Therap. Woch.*, September 25.

Helmerich's Salve: New Formula.—Triturated sulphur 10 gm., potassium carbonate, 5 gm., aq. dest., 5 gm., vaselin 40 gm. Dissolve the salt in the water, heated, add the sulphur and vaselin and stir in a warm mortar until cold.—*Jour. de Méd. de Paris*, September 18.

Dry Bismuth for Burns.—This is recommended by Lassar as the most effective of all dressings. Bardeleben prepares "bismuth burn badges" which insure a painless and reactionless healing in nearly every case.—*Dermatol. Ztschft.*, iv, 4, in *N. Y. Med. Monatsheft.*

White of Egg for Inflammations.—Lewith asserts that fresh white of egg applied with the finger soon dries into a protecting and contracting membranous shield under which itching subsides and inflammations heal.—*N. Y. Med. Monatsheft*, August.

Amyl Nitrate in Post-Hemorrhagic Anemia.—Bompiani of Rome has obtained remarkable results with inhalations of amyl nitrite in cases of acute anemia consecutive to extensive hemorrhage, and recommends it as superior to the subcutaneous injection of ether in reviving persons in danger of death from hemorrhage.—*Journ. de Méd. de Paris*, September 18.

The Sources of Hematuria.—Dr. David Stuart (London *Lancet*, July 2, 1898) classifies renal diseases with reference to hematuria, as follows: 1, traumatismal, *a*, injury, *b*, calculus; 2, passive hyperemia, *a*, pressure on renal veins, *b*, torsion of the same, *c*, reflex spasm of arterioles; 3, inflammatory hyperemia, *a*, nephritis, acute and chronic, *b*, tuberculous disease, *c*, cystic degeneration and hydatids; 4, tumors of the kidneys.

Curare in Epilepsy.—Inject, every five days, one-third of the following solution: curare 50 cm., aq. dest. 5 gm., hydrochloric acid 1 drop. Let it stand twenty-four hours and filter. The injection is not painful, does not produce any reflex symptoms and has never caused the slightest indication of intoxication.—*Jour. de Méd. de Paris*, September 18.

Absorbing Power of Potassium Iodid.—In cataract operations large doses, 3, 5 to 10 gm. a day, must be administered, and the remains of the lens will be rapidly absorbed, rendering a second operation unnecessary. In operations for myopia a small discission opening is all that is necessary with the potassium iodid, thus preventing irritation of the uveal tract by masses of lens substance.—*Klin. Therap. Woch.*, September 25.

Orthoform in Intramuscular Injections.—Loeb adds 5 to 10 per cent. orthoform to his injections of 10 per cent. hydrarg. salicylicum and paraffin, and finds that it prevents the local pain from the injections for eight to ten hours. He first tested the intramuscular injections of 10 per cent. orthoform with paraffin on himself, and established its efficacy and harmlessness. The medicinal injections were absorbed as readily as without the orthoform.—*Klin. Therap. Woch.*, September 11.

Hot Water in Hemorrhage.—Hot water injections have been found effective not only in gastric hemorrhage, but hemorrhages from the nose and lungs. Two or three injections a day with water at 45 to 50 degrees C., have arrested cases that had resisted all other treatment. One is described in the *Klin. Therap. Woch.* of September 18, a woman with commencing tuberculosis, whose severe hemoptysis had persisted for days, but yielded in one day to the injections.

Menthol in Anthrax.—Braun has found 2 per cent. alcohol solutions of menthol very effective in anthrax, curing it in much less time than usual. He applies it on a gauze strip, with which he packs the main cavity, after it has been cleaned out with cotton, and covers with an air-tight covering and compressing bandage, left for twenty-four to forty-eight hours. The application is slightly painful at first.—*Klin. Therap. Woch.*, September 18.

Aseptic Tamponade of the Uterus.—A large funnel-shaped speculum is introduced into the vagina, and the anterior cervical lip is seized with a pair of ball forceps, provided with a hook on each side, and drawn down until one hook rests on the edge of the speculum. The posterior lip is seized in the same way and hooked on the other blade of the speculum. The tamponade then proceeds as usual; the operator has both hands free, and the gauze does not come in contact with the external genitals, while he can visually inspect the whole process.—From Wyder's clinic, Zurich, *Munich Med. Woch.*, September 20.

For Subconjunctival Injections.—Take metallic iodin 1 to 2 cgm., potassium iodid 1 gm., boiled distilled water 30 gm. Inject 4 or 5 drops of this solution under the bulbar conjunctiva every two or three days, increasing progressively to 10 or 15 drops. These injections are comparatively very slightly painful, but cause a light transient chemosis. The favorable effect of the treatment becomes evident in the course of two or three weeks, as the size of the floating bodies diminishes and the scotoma improves, as does also the central visual acuity, even in cases of macular choroiditis.—*Semaine Méd.*, September 28.

Raising Paralyzed Eyelid.—J. Hirschberg (*Deutsche Med. Woch.*, September 28) describes his success with the Birnbacher operation in five cases of pistol-shot in the temporal region, causing paralysis of the eyelid on that side, although the sight was retained in some cases. No narcosis is required; the upper edge of the superior tarsal is exposed by a perpendicular incision, and three double strong silk threads are passed through it and then under the skin to above the eyebrow, where they are tied tight over drain-tubes. The free edges of the lids are temporarily sutured together lightly to prevent irritation of the cornea by the lashes. In three or four days the eyelid can be raised and closed at will, as the muscular power of the non-paralyzed muscles is transmitted to the paralyzed lid.

Tests for the Hearing.—Ostino asserts that a deficient perception of the spoken letter "S," in comparison with our consonants, indicates otitis of the internal ear, the more decidedly as the formula for the distance of perception of the other letters is inverted. If in addition "C" and "G" are also deficient, it indicates that the disturbance is not limited to the scale "do, do," but affects also the middle scale. Diminished perception of consonants spoken in a bass tone indicates alterations in the apparatus for the transmission of sounds. In affections of the internal ear there are islands of deficient perception limited to one consonant, but in affections of the middle ear, the deficient perception extends contemporaneously to several consonants of varying height and tonality, but all comprised in the lower limits of the tone scale. A deficient perception of the letter "F" is an almost constant indication of acute otitis of the middle ear, simple or with effusion, with or without perforation. Beyond the maximum limit for the perception of a consonant, it is confounded with another consonant, usually one of the same tone height as the first.—*Gazzetta degli Osp. e delle Clin.*, September 18.

Treatment of Pulmonary Gangrene.—This treatment is founded on antisepsis (editorial in *Journal de Méd. de Paris*, September 18). The patient should be placed in a large room and the air disinfected with phenicated spray. To disinfect the lungs, give one of the following potions in teaspoonfuls during the twenty-four hours: No. 1, alcoholatum eucalypti 2 gms, julep with syrup of poppies (julep diacodé) 120 gms. Or No. 2, Labarraque's solution 4 gms., sodium hyposulphite 4 gms., julep 120 gms. Antiseptic inhalations are also useful: phenic acid 50 gms., water 950 gms. Put in a bottle and inhale the vapors. Trousseau recommends essence of turpentin. Pour a few teaspoonfuls of the spirits in hot water and inhale. Jaccoud recommends for internal antisepsis: 50 cgms. salicylic acid during the day. Tonics of all kinds should be used *larga manu*, with digitalis and caffein when collapse threatens. If there are several foci, medical treatment is all that is possible, but if the gangrene is circumscribed and this treatment is ineffectual, pneumotomy and drainage are indicated. The part of the lung involved has been resected in some cases with satisfactory results.

Sattler's Operation for Myopia.—This operation has been performed on thirty patients to date, and has proved more than satisfactory; the operative astigmatism is very slight as a rule; the eye heals much more rapidly than with other methods and without the least inflammation, in nearly every case; and only two interventions are required. He first makes an incision 5 to 7 mm. in length, perpendicular to the vertical meridian and about 1.5 mm. from the edge of the cornea, with a Weber hollow lancet. The anterior capsule is then seized with a sharp hook and the lens substance loosened at the equator and from the posterior capsule. A Daviel spoon is then pushed a little way into the front chamber, slightly pressing down the upper lip of the wound, while another Daviel spoon is applied to the region of the lower edge of the cornea in a horizontal position with a moderate pressure backward. By this maneuver the entire nucleus is evacuated and the process is repeated a second or third time, as long as it brings lens substance without difficulty. The iris is then replaced and one drop of atropin instilled. The amount of the lens substance thus evacuated amounts to two-thirds or even three-fourths of the entire lens. In some cases this intervention is sufficient, but usually discission of the posterior capsule is required later. He has recently applied this same operation to nine cases of lamellar cataract with perfect success.—*Klin. Therap. Woch.*, September 18.

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SATURDAY, OCTOBER 29, 1898.

AGAIN THE BICYCLE.

At more or less regular intervals the medical journals discuss the use and abuse of the bicycle. That the latter is a valuable aid as a promoter and restorer to health the active partisanship of the bicycle world will testify, regardless of any and every attack made by physicians. Like every other therapeutic resource, it should not be applied indiscriminately to all cases; such a course would soon establish an abuse. No one would advise a patient afflicted with organic heart disease to become a professional "scorcher," or to exercise to the extent of a fifty- or a hundred-mile run, any more than he would countenance a hundred-yard dash as a daily exercise, yet we can easily see how an easy ride of five or ten miles or a walk of the same distance would be of great advantage to such a patient. Every individual is a law unto himself. Where one would look upon a century run as but a pleasant bit of exercise, another, in apparently equal physical health and with the same training, would be incapacitated for several days by such an effort.

A number of years ago, before cycling attained its present popularity, medical writers warmly discussed the terrible results this sport would have upon the female pelvis, especially as regards child-bearing. The manufacturers quickly took advantage of this state of affairs, and reaped the rewards of their industry in the sale of various patterns of sanitary saddles, so-called. We are not aware that the obstetricians are having any greater difficulty in delivery than formerly; possibly it is due to these very saddles, possibly not. The heart was the next to claim the attention of the bicycle enemy. We read the dogmatic statements of a medical brother that no one with organic heart disease should ride a wheel; we were impressed with his reasoning and nodded sympathetically as we perused his doughty arguments; and we turned contemplatively the pages of the JOURNAL and were soon absorbed in Professor A.'s article on "The Use of the Bicycle in Organic Heart Disease"; and perhaps as we glanced out of the window we observed that infatuated Dr. B., with his aortic incompetency, wheel smilingly by as he makes his rounds, happily unconscious of his deadly peril. And now it is the kidney, and it must be confessed that there is evidence of a more tangible character here. MUELLER (*Munchener med. Woch.*, 48, 1896) reports his observations on the urine of twelve cyclists, eight of whom were in training and the remaining four not. Their rides were from one and a half to three hours at an average rate of speed. Examination before the ride showed the urine free from albumin in all instances save one—a professional. Seven of the eight in training showed a marked albuminuria after the ride; six of the eight, including the one whose urine contained no albumin, showed large numbers of casts, for the most part of the hyaline variety, and a few white-blood corpuscles. Of the four untrained cyclists, two developed albuminuria and a third the presence of cylindroids after their ride. In all these cases these rather alarming symptoms disappeared in a few days, leaving no trace. "Leaving no trace;" and if there is one thing that pathologists have endeavored to impress upon the profession, it is that a chronic irritation will eventually result in the evolution of new-formed connective tissue, and again that new-formed connective tissue, in whatever part of the body it may be found, will in time undergo cicatricial contraction; in the kidney this would mean a condition of chronic interstitial nephritis. The above cases were taken at random, and probably correctly reflect the urinary phenomena of a large majority of cyclists. Your enthusiastic wheelman rides every day that he has a possible excuse for so doing; in other words, he produces a condition of chronic congestion in his kidneys that is practically constant, for, as MUELLER says, several days elapse before the alarming urinary symptoms entirely disappear. Is this condition any less dangerous than that chronic congestion produced by the ingestion of alcohol? Surely the decryer of the bicycle would have enough to rave against were he to leave the heart alone and turn his attention solely to the kidneys. Nevertheless, the bicycle will survive.

THE DOCTOR IN THE SCHOOLROOM.

In these doleful days of overcrowding and hospitalism it ought to be welcome news that a new field is opening up for our professional activity. To the prophetic vision of the Cassandras of both sexes in our ranks—and they are many—the direful prospect

has already presented itself of the day when disease having become extinct through the noble but suicidal efforts of the doctor and sanitarian, our occupation, like Othello's, will be gone. Any new outlet for our energies will help to either postpone that *dies iræ* or to mitigate its horrors when it does arrive. And we wish to seriously call the attention of the profession to the fact that there is opening up before us today in the schoolroom an almost entirely new field of usefulness, one which could profitably absorb the entire energies of one-third of our present membership and whose possible extent and usefulness to the community are alike well-nigh unlimited.

Within the past fifteen or twenty years there has come a change in educational ideals and methods which amounts almost to a revelation. Up to that time the wheels of the educational machine had been placidly revolving in the comfortable ancient rut of the belief that education was solely a matter of the mind, of the intellect, regardless of the body. That this intellect aforesaid could be trained and increased in power and grasp simply by putting it through a divinely-ordained course of stereotyped mental gymnastics. The chief problem was how to make the young idea acquire a certain standard number of mind tricks by a certain age. All that was required of the body was that it should not interfere with the progress of the course, by breaking down or going to sleep. To avoid these undesirable contingencies it had to be considered and even humored a little occasionally, but officially recognized, never. It was by nature opposed on principle to the entire process and must be rigidly disciplined with an iron hand to submit to it. True, the course of necessity extended over some ten or fifteen years of the child's life, and during that period the body grew and developed in a most remarkable way, but that was a mere coincidence, the mental growth was all due to the scholastic drill. Time spent on training the body was simply time wasted, the mind alone was worthy of attention.

Now all this is wonderfully changed, although the old error dies hard and still holds much of the field. It is becoming recognized that the mind has an inevitable natural tendency to grow and to follow certain laws of development just like the body; that the extent of this development can not be altered or added to by "taking thought" much more than the "stature;" that this growth proceeds on absolutely parallel lines with that of the body and for the most part *pari passu* with it; that whatever hinders the healthy development of the body hinders or impairs the growth of the mind; whatever promotes the one favors the other.

A new science has been added to the teacher's "requirements"—Child-Study. The idea has at last dawned that education was made for man and not man for education: that the system should be made to fit the child, not the child the system, as hitherto. Hence the burning question of the day is, "What is the child?" "What is the natural history of the young human animal?" And the only man in the community at all competent to answer that question is the family physician. And even he needs much training before he can safely be accepted as an authority upon the subject. He has a good fundamental training, and his knowledge of the subject, both scientific and personal (practical), is fairly extensive, but it needs classifying, systematizing and testing by abundant actual experiment in the schoolroom. The relations between the teacher and the doctor have not been at all as intimate as they should be nor the feeling as cordial. Both have exhibited too much of that clerical spirit which HUXLEY describes so pithily as "that frame of mind engendered by much speaking without fear of reply." The doctor has been too ready to denounce what he can see to be the hurtful absurdities of the teacher's Chinese worship of ancient method without a proper appreciation of the practical difficulties of the problem of the teacher's position. He is between the devil of the doctor and the deep sea of the proud and *exigeant* parent, who raises a "yellow roar" if his young hopeful does not know his seven times seven at eight and his capitals of Europe at nine precisely.

Hence we must not be surprised if the teacher resents our criticisms, however well meant, and is inclined to regard us as a sort of perpetual opposition, only too anxious to advise the anxious mother to take her delicate child out of school, when the real cause of the "break down" has been parties and pie.

The child is little, physically, but it takes at least four people to understand him, the doctor, the teacher and *both* parents. And the time has now fully come when the doctor's contribution to this science should be prepared and made available for use in the great new educational advance. The parent has full confidence in us, and the teacher is beginning to lean toward us, though slowly and half reluctantly, and if we but respond as we should, there is opening out before us one of the noblest fields of usefulness to the race that we can conceive of. What, then, are the questions upon the solution of which our assistance is beginning to be demanded? They are many and hard and will increase in number and difficulty, but they fall into three great groups. The first group concerns the hygiene of study and of the school, the school-room and building itself, the playground, the hours of study, of meals, of recreation. The second group concerns the physical fitness of the child for study, his eye-sight, hearing, muscle-balance, digestion, sleep, powers of resisting fatigue at different ages, periods and sexes. The third relate to the most fundamental and fruitful question of all: What is the child; what are his interests, his needs at successive ages; what course does he naturally follow in his development? We are beginning to trust

instinct and nature even in the school-room. In response to the first group of questions we can return fairly positive answers, for enough careful work upon the problems of school-sanitation has already been done by certain members of our craft to render the principles of the science and art fairly clear and definite. But to reduce them to practice in a given building is a problem worthy of our best ingenuity. And it is amazing how many of them are utterly disregarded even in our modern buildings. Sufficient desk-space for a given number of children in rooms that look fairly light is secured, and then the vital questions of the plumbing, ventilating and heating are solved by letting them to "any reliable" firm making the lowest bid or having the most plausible or persistent representative. Perhaps a land-surveyor known as the "city engineer" may be consulted or a busy doctor asked for an off-hand opinion, but usually the united ignorance of the school-board regards itself as fully competent to decide. A committee appointed to investigate the public-school buildings of one of our most progressive large cities reported over half of them defective and a fourth of them disgraceful. There ought to be a physician on every school board and in every town of more than two thousand inhabitants, as school physician, with salary enough to enable him to devote a substantial share of his time to the study and remedy of these conditions. Nor is this merely one of the "ought to bes" of the Utopian future. In Boston there are already four physicians who, we believe, devote their entire time to this invaluable work and our most prominent educators are declaring that school-hygiene is to be the burning question of the coming quarter century. The matter is being taken up in teachers' conventions, "normals" and summer-schools all over the country. The conviction has been brought home to teachers by practical experience that to get the best work out of a class of children you must place them under the most favorable hygienic conditions possible. They are taught that unless the air be fresh and the room cool, little can be expected of the pupil in the way of either attention or industry. The better class of teachers everywhere are, as a rule, keenly alive to the defects of their rooms and eagerly anxious for competent advice and assistance to remedy them. A daily visit from and consultation with a medical inspector would be welcomed by them. A proper adjustment of window-space to floor, of cubic air-space to each child, of the desks to the direction of the light, of the height, slope and "hang" of the ventilation and heat-supply, would make a wonderful difference in the effectiveness of any building as an educational appliance. Then would come the consideration of the play-ground. This has grown up hitherto as a sort of accidental adjunct to the school-building and in many cases seems to be regarded as a necessary evil, which may be reduced to its lowest possible terms with impunity. All that seems to be considered essential now is enough open space about the building to give it sufficient light, so that its shape and size are those of a narrow "halo" for the former. The school-house monopolizes two-thirds of the spaces leaving only a tiny plat in front, a narrow strip at the sides and a larger plat behind. The lot is bought to fit the building, and whatever ground happens to be left over is turned into a play-ground. Now, this is all wrong, for the play-ground is as necessary and important a part of a good school as the building. The educational and hygienic value of a play-space is enormous. For ourselves, if we were compelled to choose between a school-house without any play-ground and a play-ground without any school-house, we would prefer the latter. A certain area per child ought to be provided just as much as a certain cubic air-space of house room. At least a fourth, if not a third, of the building fund ought to be spent upon the grounds. A liberal space ought to be roofed with glass so as to be available in wet or stormy weather. But what recognition of its importance do we find? Little or none. Not content with reducing it to a mere border around the building and fag end of the lot, we choose the best part of the ground to put the building on. We have seen a building containing four hundred children and its only play-ground the rear half of the lot, which sloped so abruptly down into a ravine that neither gravel nor sand would lie on its surface. Worse yet, with a positive refinement of idiocy, if the remnant of the lot happens to lie in front of the house it is delicately laid down in turf, planted with ornamental shrubs and decorated with signs, "Keep off the Grass"! which ought to be supplemented by placards, "Go Play in the Gutter"! Grass and geraniums are evidently "of more value than many children."

THE DEPOPULATION OF ONTARIO.

The question that has been troubling the French sociologists for the past few years—the low and decreasing birth-rate in their country—is now also becoming a living one with our neighbors over our northern borders; and it would appear with even greater show of reason. If a birth-rate of only 22 to the 1000 should give concern to the French statesmen and physicians, the still lower one of only 20.7 in the Province of Ontario ought, it would seem, to excite still livelier apprehensions for the future of a country that is thus failing in the very source of power, the production of an active and aggressive population. The problem is made the more serious by the reverse condition existing in the adjoining Province of Quebec, where a very high birth-rate has long existed in what some would claim is in many respects an alien and inferior race. The result is that, as in some parts of New England, the French Canadian is crowding out the Anglo-Saxon in certain regions, and fear is expressed that unless

some reversal of present tendencies occurs, all of Eastern Canada will become thus transformed. The matter has been the subject of extensive discussion by the Canadian press, has been seriously considered in at least one convention of a prominent religious body, and will, it seems probable, give still more disquiet to the minds of Canadian publicists and patriots before any final satisfactory facts or conclusions are developed.

As we have said before in this JOURNAL, the question is more a sociologic than a medical one, and yet it has its medical side, and there are many points of view from which it may be of interest to us as physicians. In Ontario the people are, as in France, moderately prosperous, thrifty and forehanded, and in addition to this they annually lose, as in New England, a considerable proportion of their most virile and energetic element by emigration. These are exactly the conditions that might be supposed to tend to a restriction of the birth-rate; the conditions favoring the existence of an aggressive proletariat are lacking. In Quebec, on the other hand, the latter are directly favored by the influence of the Government and the church, as well as by the racial character and social state of the population, which has not been modified as in France, by military and political changes during the past hundred years. In this province we have still the Frenchman of the seventeenth or eighteenth centuries, but living under vastly more favorable conditions; not the French peasant or citizen of today with his burdens of militarism and his non-prolific tendencies.

It has been often charged, especially by some social alarmists among the clergy and elsewhere, who support themselves by the statements of a few medical writers, that amongst the Protestant population of the eastern border of our continent certain very reprehensible practices are commonly resorted to to check the increase of families, such as actual criminal abortion and other illegitimate methods. That any wholesale charges of this kind are likely to be unjust ought not to require argument. A population losing permanently its more vigorous male population by emigration is likely to have its birth-rate reduced. When the late marriages, and the enforced spinsterhood of an undue proportion of the female population are also considered, the case is rendered still clearer. The French Canadians, on the other hand, emigrate to return or take their women with them, their ideals of living are not so high and they marry early, and are probably not specially influenced by considerations of prudence in such matters, while, as already said, they have the direct encouragement of the provincial government, which, it is stated, offers a bounty for large families, and the active sanction of the church. If other proof were wanting of the more direct dependence of the birth-rate upon social and political conditions than upon racial or physiologic peculiarities, the comparison in this regard between the Gallic race in Canada and in its native France at the present time would alone be sufficient. There is, it is true, a physiologic side to the question; it is well known that high feeding diminishes reproductive capacity in animals, and it is more than merely probable that the same law applies to the human species. The more luxurious, or even the more comfortable we make a people in their living or diet, the less their fecundity.

There is still another feature of the problem that is worthy of attention in a medical point of view. A high birth-rate generally implies also an augmented death-rate, especially in the earlier periods of life. This is seen in the slums of our cities, and everywhere by the general practitioner, who finds the greatest infant mortality in the class that is most productive in this respect. Were this not the case, the question of population would be a more serious one than it is at present, but the fact implies a great waste of human life. It has been calculated that if only one woman in six should do what she was well able to in the way of producing children, the population of the earth could be easily maintained. The rest is a simple arithmetical problem—if four, five or six women out of the six are to do likewise, nature must interfere with some provision to keep down population, and this is generally effected to a large extent by increased infant mortality. At the present time France, with the lowest birth-rate in Europe, has also the smallest death-rate while in some parts of Russia exactly the reverse conditions prevail.

The low Ontario birth-rate, however we may view it, is nevertheless a misfortune to Canada, the greater since, unlike the somewhat similar state of affairs in some of the New England States, the country as a whole does not profit by her emigrants. They come over the border very largely, to add to the wealth and population of the United States, and Canada is the loser. In any way it can be considered, it is a matter worthy of the close attention of Canadian statesmen and patriots.

CEREBRAL TETANUS.

Tetanus has always been regarded as a nervous disease, but it is only since the discovery of the tetanus toxin that one could say precisely that the disease is due to a poisoning of certain nervous cells. The affinity between nervous cells and tetanic toxin is shown very well in the following experiment of KNORR, inspired by WASSERMANN and TAKAKI.[1] The cerebral substance of a guinea-pig is emulsified and mixed with tetanus toxin, and this mixture is then centrifugalized. Two layers form: at the bottom, the nervous matter; above this an opaque fluid. In well-made mixtures it will be found that the fluid thus separated does not contain any poison, which has been fixed to the nervous tissue after the manner

[1] Münich. med. Wochenschrift, 1898, No. 12.

of a coloring matter. This tangible reaction which occurs in the test-tube also occurs in the organism. The tetanus toxin injected subcutaneously in an extremity of a guinea-pig becomes fixed by the cells of the spinal cord after a certain time, when characteristic contractions appear, part of the poison reaching the cord by way of the nerves, another part by way of the circulating blood.

This specific affinity of nervous elements for the toxin is also shown when one injects the toxin into the brain of a rabbit. In this way is produced a characteristic disease, namely, cerebral tetanus, which has recently been studied by ROUX and BORREL.[2] This fact alone overthrows the opinion of WASSERMANN,[3] that there exists an antitoxin in the normal brain. The poison adheres so strongly to the nervous material with which it is mechanically mixed, that when introduced into the subcutaneous tissue of animals it is not diffused, but is taken up and digested by phagocytes.

The immediate fixation of tetanus toxin by nerve-cells renders it possible to limit the action of the toxin to certain groups of cells. Thus when toxin is injected into the brain of the rabbit or the guinea-pig, there develops as shown by ROUX and BORREL, a disease characterized by intermittent convulsions, motor paralysis and polyuria, together with characteristic psychic disturbances. The injection of five times as much sterilized water or physiologic salt solution in the same manner as a small amount of toxin does not produce any symptoms, hence the results can not be ascribed to mechanic injury.

Eight to twelve hours after the injection the animal becomes restless, turns its head from side to side, runs around in the cage. Abundant urine is secreted; epileptiform convulsions come on, either simultaneously or on slight excitation. The animal grinds its teeth and the wires of the cage; at the same time the hind legs may become paretic. Intermissions in these symptoms often occur. One-tenth c.c. may kill the animal in from twelve to twenty hours; smaller doses give rise to an affection lasting from three to eight or more days; still smaller doses of toxin cause a tetanic affection, with emaciation, from which recovery may take place. It is possible to inject the toxin into various parts of the brain with marked differences in the symptoms produced, and thus there is furnished a novel method of studying the functions of the various regions of the brain that may be of interest from a physiologic standpoint.

The rabbit is much more resistant to tetanus toxin when it is introduced under the skin into the blood than when it is introduced into the brain. The guinea-pig resists the intracerebral injection somewhat better than the rabbit, but the cerebral tetanus of the guinea-pig is as characteristic as that of the rabbit. In the rat the symptoms of cerebral tetanus are markedly psychic. The animal appears to be subjected to sudden attacks of great fear, and frequently it acts as though it were under the influence of certain delusions or hallucinations.

An animal which receives antitetanic serum acquires a so-called passive immunity and withstands many times the fatal dose of tetanus. ROUX and BORREL made the following experiments: They injected large doses of antitetanic serum subcutaneously into rabbits. Twenty-four hours afterward .1 c.c. of tetanic toxin was injected into the brain, and all the animals died with typic cerebral symptoms in from forty-eight hours to six days later. And yet the blood of these animals contained antitoxins. One drop of the blood of an immunized rabbit mixed with the tetanus poison rendered the mixture inoffensive, when introduced into the brain of a new rabbit. The extravasation of a small amount of blood during the intracerebral injections of immunized animals may neutralize the toxin and prevent the appearance of cerebral tetanus. In guinea-pigs, therefore, similar experiments often failed to produce the desired result, because their brain is more vascular than that of the rabbit and less susceptible to the tetanus toxin.

All these facts can also be demonstrated to be true as to the diphtheria toxin, which is more rapidly fatal when inserted into the brain than under the skin. Immunized animals resisting enormous doses of toxin given subcutaneously perish when a small quantity is introduced into the brain. The symptoms are more exclusively nervous, and at the autopsy one does not find any of the characteristic lesions of diphtheria intoxication, as for instance, congestion of the suprarenal capsules, because all the other organs have been protected by the antitoxin except the nerve-cells. Hence it is very evident that the nerve-cells have not the same affinity by any means for the antitoxin as for the toxin. This is probably the reason why, in the prevention of tetanus, antitoxin serum so often fails, because when the antitoxin is used a part of the toxin has already become fixed to the nerve-cells. The antitoxin may neutralize the poison which is still circulating, but does not reach that which is fixed by the cells of the brain or spinal cord.

Further experiments by ROUX and BORREL show that a few drops of antitetanic serum injected into the brain have a much better effect in tetanus of animals than large quantities of antitoxin introduced into the blood or under the skin. Intracerebral injection does not save all the tetanized animals. It must be injected before a certain length of time has elapsed after the poisoning. Before recommending this method of administering antitoxin in human tetanus ROUX and BORREL insist that it will be necessary to extend the experiments to various species of animals, because it may be that in the horse and sheep, for instance, as well as in man, the results

[2] Annales de l'Institut Pasteur, 1898, No. 4.
[3] Berlin klin. Wochenschrift, 1898, No. 1.

would be different from those observed in guinea-pigs and rabbits.

As already stated, rabbits and guinea-pigs passively immunized suffer from cerebral tetanus when the toxin is injected into the brain. The question arises: Is this also the case in animals whose immunity is active? This question is very pertinent, because many observers have advanced the opinion that antitoxin is elaborated by the cells which are susceptible to the toxin; that each symptom which is influenced by the toxin responds by producing antitoxin. Two rabbits immunized against tetanus, and possessing an antitoxic serum, were found to be insusceptible to subcutaneous injection of 12 c.c. of tetanus toxin, which was fatal in a dose of 2 c.c. in the case of a susceptible rabbit. One-tenth c.c. of toxin was introduced into the brain of the immune rabbits at the same time as into a normal control animal. On the following day all the rabbits presented signs of cerebral tetanus. The control animal died during the course of the day; the immunized animals died with typic symptoms, one after seventeen days, the other after twenty days. These experiments demonstrate that the nerve-cells of an actively immune rabbit are sensitive to the toxin and that it becomes very difficult to understand how these nerve-cells could prepare an antitoxin. It would appear, on the other hand, as if during the course of the immunization the nerve-cells had never come into contact with the toxin.

Certain animals are naturally immune to various microbic toxins. The rat, for instance, does not suffer from a dose of diphtheria poison which is sufficient to kill several rabbits. One-tenth c.c. of diphtheria toxin was injected into the brain substance of a rat, and death followed on the third day, hence the brain of the rat is also sensitive to the poison, and as it does not die when large quantities of toxin are injected subcutaneously, it follows that the poison does not then reach the brain but is arrested in some part of the body. The natural immunity of the rat does not depend upon the resistance of the nerve-cells against diphtheria, but upon some other property of the body. ROUX and BORREL showed that similar facts obtained with regard to the rabbit as to morphin, toward which this animal is looked upon as being insusceptible. In other words, the nerve-cells of the rabbit are not insensitive to morphin.

All the facts go to show that in acquired as well as in natural immunity against certain poisons, the immunity does not depend upon insusceptibilty of the nerve-cells, at least not of those of the brain. The poisons are retained by other cells, which exercise a protective rôle and probably manufacture antitoxins. ROUX and BORREL ask: Where are those cells? and answer that perhaps phagocytic cells are capable of also destroying the poisons produced by microbes. They are not ready to insist upon this, but it would seem to them that the questions of immunity against the microbes and of immunity against the toxins will ultimately receive similar solutions.

CREOSOTE NOT A SPECIFIC.

The drug, creosote, has become so inseparably connected in history, in clinical experience, and in present day teachings, with the disease of pulmonary tuberculosis, that its acceptance as a specific becomes a natural consequence. Such empiricism, however, is fatal to the scientific treatment of tuberculosis even though creosote does seem to be indicated in every case. Creosote probably exercises its curative action in the lung because of its physiologic property of stimulating the bronchial mucosa, where it is eliminated, and its action as an expectorant; not as a specific for the disease of tuberculosis.

The healthy human body is not susceptible to infection by the germs of tuberculosis because a vital resistance of the tissues prevents the development of any bacteria that may gain entrance, and those bacteria that develop in a lung to cause a miliary tuberculosis, do so because—from malnutrition, lack of exercise, the inhalation of sewer gas or dust particles, an ordinary cold or a previous attack of pneumonia—the lung tissues possess a diminished resistance and afford a suitable soil for their development. A diminished resistance is probably present in the bronchial mucosa, of which there is a vast expanse in the lung, and when an infection is once established at a given point it is clear that the adjacent mucosa will afford slight hindrance to an extension of the tubercular process. The object of our treatment should be to raise the vital resistance of these adjacent cells of the bronchial mucosa, in order that they may resist an extension of the disease and thus limit the tubercular inflammation to a single spot, which should mean an eradication of the disease. Creosote *does* improve the resisting power of each cell, because it stimulates it to a more perfect metabolism, and if to this favorable condition there are added an abundance of good food to supply these cells with nourishment, and plenty of fresh air to supply the blood with good red oxyhemoglobin that may further assist their metabolic processes, the patient is placed under the best conditions for recovery. The creosote, it will be observed, does not exercise an antibacillary action, nor does it even diminish the virulence of the tubercle bacillus, but as a treatment for tuberculosis it is the most satisfactory agent that we know, since it succeeds in establishing a condition of health in the mucosa that will help nature to overcome the disease.

CORRESPONDENCE.

The Jugglery of Statistics. A Reply to an Absurd Editorial.

WASHINGTON, D. C., Oct. 22, 1898.

To the Editor:—I desire to invite attention to the editorial comment in the *Philadelphia Medical Journal* of Oct. 15, 1898, under the caption: "The One Fact the Whitewashing Committee Must Explain." I would not have troubled you with this communication but that I have regarded the said

journal as a paper of value and of increasing importance whose editorial utterances should have weight. The article to which I take exception as unworthy of the columns in which it appeared, presents to its readers the large ratio of deaths from disease in the Spanish War, as the one fact to be explained, "the crux of the entire discussion," and manifestly elated with his discovery, the editorial writer exclaims in a burst of triumph: "Explain us that right thoroughly and without equivocation, Honorable Sirs," etc. This exuberance of diction from the editorial pen manifests that the writer sent his manuscript to the printer while dazzled by the brilliance of his discovery and without giving it that careful consideration which is needful for the reputation of the editorial columns. I am constrained to look upon this as the explanation of the article. Doctors are generally credited with being weak on figures, and my experience shows that they are not strong in questions of ratios, making honorable exception in this regard of the health officers who deal systematically with medical statistics. I must charitably suppose that the writer in question participates in the general professional failing because I am unwilling to believe that he knowingly presented figures which did not sustain his conclusions, trusting that the latter would be accepted by readers who were unfamiliar with his arithemetical premises. These premises are that: There were killed in the War of the Rebellion 46,874, died of wounds 39,715, died of disease 172,907; and in the recent war: killed 289, died of wounds 65 and died of disease 2565. These figures are official, and I have no exception to take to them. But he continues: "If we reduce these figures to percentages based on the best estimates of the numbers of soldiers participating, and place figures side by side we find:

"Causes of Deaths.	Civil War.	Spanish War.
Killed	18.1%	9.6%
Died of Wounds	15.3%	2.3%
Died of Disease	66.6%	88.1%."

Now in the calculation of these ratios no consideration is given, as claimed by the editorial, to "the best estimates of soldiers participating" nor, I may add, to the relative duration of the two wars. They express merely the relative proportion of deaths from battle casualties and disease in the constitution of the total mortality. Yet from these data the editorial writer, knowingly or unknowingly, concludes that the 88.1 per cent. of deaths from disease in the Spanish War, as compared with the 66.6 per cent. in the Civil War is a point of the highest importance. "There can be no possible question" he says "that the general mortality from disease has been greatly and indubitably lessened in the last thirty-three years. If so, of course the percentage mortality from disease in the Spanish War should be decidedly lower than in the war of the Rebellion. Instead of this it has been decidedly higher," and the members of the Presidential Investigating Commission are called upon to take note that the medical profession regards the cause of this as the main thing that is before them for explanation.

The absurdity of this may be well illustrated by adding to the statistics and ratios given above those derived from the reports of the engagement of Admiral Dewey's fleet on May 1, 1898, at Manila. Dewey's fight lasted only one day. The figures given for the Spanish War covered a period of five months and those for the Civil War a period of five years and two months; but as the element of time does not enter into the calculations of the ratios criticised this element need not be considered in the engagement at Manilla. Here we find that no man was killed, no man died of wounds received, but that one man, an engineer officer, succumbed to heat exhaustion or insolation. Stating these figures as percentages of the total mortality we find: killed 0 per cent. died of wounds 0 per cent, died of disease 100 per cent, as compared with 88.1 per cent. in the Spanish War and with 66.6 per cent. in the War of the Rebellion. If it is needful for the Honorable Sirs to give such high consideration to the greater death-rate from disease as compared with the deaths from wounds and deaths on the battle-field in the Spanish War considered as a whole, how serious is the consideration they ought to give to this frightful rate of mortality from disease as compared with that from battle casualties in the Bay of Manila.

It was my intention in beginning this letter to state the conclusions that are really admissible from the figures and ratios presented by the *Philadelphia Medical Journal*, but the pressure of current work at this time is very great, and I conceive that I have effected my purpose by directing attention to the unsubstantial basis on which the argument of the editorial writer was constructed.

Repectfully yours, CHAS. SMART,
Deputy Surgeon-General, U. S. Army.

Twins with Complications.

LAUREL, IOWA, Oct. 18, 1898.

To the Editor:—October 2 I was called to attend Mrs. R. in confinement and found myself confronted with a number of unpleasant conditions, not the least of which was a morbid fear on my patient's part that she would not be able to give birth to her child, or children as proved to be the case, she having been told at her previous confinement, about a year ago, when she gave birth to triplets, all still-born, that she would not live through another confinement. She was a German woman, large and strongly built, about 40 years of age and had given birth to five children, the oldest 14 years of age. She said she had suffered a great deal at all her previous confinements and that they had been slow, lasting from twenty-four to forty-eight hours. She complained of being "deathly sick" and felt as if she was going to vomit.

From the size and shape of the abdomen, I concluded I had a case of multple pregnancy, but the sound of but one fetal heart could be heard on auscultation. Digital examination revealed an irregularly contracted vagina, due, no doubt, to the healing of her previous lacerations. The os, however, was fully dilated, and I found a foot protruding, which as a strong pain now came on, I grasped, making slight traction and with some manipulation succeeded in bringing down the other foot. During the next pain the body was born and the head, with chin to the front, was engaged in the superior strait. Now, when good pains were most needed, the patient "gave up" and wished me to leave her to die, as she had been told that she must. Finally, after a delay (which proved fatal to the child) she was delivered of a large girl weighing eight pounds. Another child could be outlined high up in the fundus uteri, and digital examination showed a "cone-shaped" bag of water through the os. The fetal parts could not be made out. The patient gave up entirely, and I let her rest an hour and a half, when, as the pains did not come on, I gave her 15 m. fl. ext. ergot and in a short time they again became quite strong and regular. Another digital examination showed that the child was not presenting, hindered, I think by the low attachment of the placenta. But by making slight downward pressure from above during a pain, I finally succeeded in getting the parts to engage. The sac, which was very dense, had to be ruptured, when an unusually large amount of the liquor amnii came away and I found a foot protruding almost exactly as did the first one. The child, a boy, also weighed eight pounds and was alive, but minus the penis. Where the penis should have been there was a slight elevation about one-eighth of an inch above the surface, with an opening at the apex, through which the child urinates. The placenta, which was delivered in about thirty minutes, also seemed to share in the general anomalous condition. It consisted of two distinct placentæ, seemingly enveloped in a common sac. They were connected at their sides by a strong fibrous band and each had

a circulation of its own, there being no anastomosis of blood-vessels between them. I report this case because of its many bad features and of its comparatively happy ending, as at this writing the mother and baby are doing well. I hope it may be of interest to at least some of the readers of the JOURNAL, who, like myself, have not practiced long enough to become familiar with this class of cases and patients.

Respectfully L. W. PENCE, M.D.

ASSOCIATION NEWS.

To Commemorate Joseph O'Dwyer's Name.—At the meeting of the Section on Diseases of Children of the AMERICAN MEDICAL ASSOCIATION held at Denver, Colo., June 7-10, 1898, it was moved and carried unanimously that a Memorial Committee be appointed to commemorate the late Joseph O'Dwyer, with suitable powers, etc., to collect such moneys and to act with other bodies for the same purpose. The committee is composed of the following: Dr. Louis Fischer, New York, chairman; Dr. J. P. Crozer Griffith, Philadelphia, and Dr. F. E. Waxham, Chicago.

SOCIETY NEWS.

Tri-State Medical Association.—The Tri-State Medical Association of Mississippi, Arkansas and Tennessee, meets in Memphis, Dec. 20-22, 1898. Physicians attending this meeting are promised a pleasant and profitable time in the "Queen City of the Mississippi Valley." Titles of papers should be sent to Dr. Richmond McKinney, secretary, Continental Building, Memphis, Tenn.

Utah State Medical Society.—At the recent meeting of this Society the following were chosen officers for the ensuing year: President, C. M. Wilson of Park City; vice-president, Ira A. E. Lyons of Salt Lake; second vice-president, J. W. Aird of Heber City; secretary, R. W. Fisher of Salt Lake; treasurer, E. S. Wright of Salt Lake; board of censors, G. M. Perkins of Ogden, W. W. Betts of Salt Lake, G. L. Smart of Springville, H. J. Powers of Ogden, A. J. Hosmer of Salt Lake.

Cumberland County (N. J.) Medical Society.—This society held its semi annual meeting at Hotel Cumberland, October 11, with the president, Dr. A. Judson of Newport, in the chair. A paper on "Peritonitis" was read by Dr. Hummel of Deerfield. Dr. Charles P. Noble of Philadelphia read a very interesting and instructive paper on "Conservatism in Gynecology." The society unanimously voted to celebrate its eightieth anniversary on Dec. 8, 1898.

Mississippi Valley Medical Association. The following officers were elected at the recent meeting: President, Duncan Eve, Nashville, Tenn.; first vice president, A. J. Ochsner, Chicago; second vice-president, J. C. Morfit, St. Louis; secretary, Henry E. Tuley, Louisville, Ky. (111 W. Ky. St.); treasurer, Dudley S. Reynolds, Louisville; chairman of committee of arrangements, Harold N. Moyer, Chicago. Chicago was selected as the next place of meeting, in October, 1899, the date to be determined by the executive officers and the chairman of the committee of arrangements.

Washington, D. C., Medical Society.—At the meeting of the 19th inst. Dr. Sterling Ruffin presented the specimen and gave the history of a very interesting case of aneurysm of the aorta, which involved the entire arch, but did not give the symptoms of pulsation during life; the other usual symptoms, however, were well marked, the patient eventually dying of inanition. The subject was discussed by Dr. Claytor, who referred to the latest points of diagnosis, calling especial attention to the frequent mistake of considering the presystolic murmur associated with that form of aneurysm as being of valvular heart origin, and the subsequent injudicious treatment with digitalis. He referred to similar cases occurring in his own practice. Dr. Storch read an essay entitled "Function of the Appendix Vermiformis." The principal function which he assigned for this organ was that of a lubricant to the caput coli. He considered constipation, and not obstruction by intestinal contents, the cause of appendicitis; he considered the appendix a necessary organ and its function an important one. Dr. D. S. Lamb did not agree with Dr. Storch, but believed the appendix had no physiologic function. He regarded the organ as a degeneration of a formerly existing diverticulum from the intestines, and being a degeneration was prone to disease. He considered the only function the organ possessed was that of inducing disease and death. He went into the morphology of the appendix, calling attention to its existence in certain animals and absence in others, and explained the evolution, anatomically, which appeared to explain its origin. The discussion was continued in a very interesting and instructive way by Drs. A. F. A. King, Stone and J. Ford Thompson.

Detroit Academy of Medicine.—The annual meeting of the Detroit Academy of Medicine was held October 13, and the following officers elected for the current year: President, F. W. Robbins; vice-president, Geo. Duffield; secretary and treasurer, H. D. Jenks; trustee, J. E. Emerson. Reports from retiring officials showed the society to be in a flourishing condition. The annual address was given by the retiring president, Dr. David Inglis, on "Social Factors of Today and the Future of the Medical Profession." He said that for weal or woe the steady trend of modern life is toward socialism. Socialism as distinguished from individualism has already affected the medical profession in the matter of the license to practice being restricted to qualified practitioners. There can be no doubt that all thoughtful medical men favor State examining and licensing boards. Michigan is an unfortunate example of pure individualism in this matter. Socialism, as exemplified in the change from competition to combination, is at the bottom of the steady extension of hospitals, dispensaries, railway and other contract surgeons and physicians. Like the trust and department store, these phases of combination are probably permanent. Socialism as exemplified in the concentration of wealth seriously affects medical incomes. If, as the *Iron Age* puts it, "Prosperity has returned, but it is prosperity based on a permanently lowered rate of wages," medical incomes must also be permanently lowered. Finally, as it seems likely that the way out of combination of capital for private gain will be found in the combination of capital for the public weal, the full establishment of a commonwealth, so medical men will find under the socialism so evolved an opportunity to pursue scientific medicine unhampered by the present overpowering commercialism. After the regular meeting Dr. and Mrs. Inglis entertained the members and their wives.

NEW INSTRUMENTS.

A SCIENTIFIC OZONE INHALER.

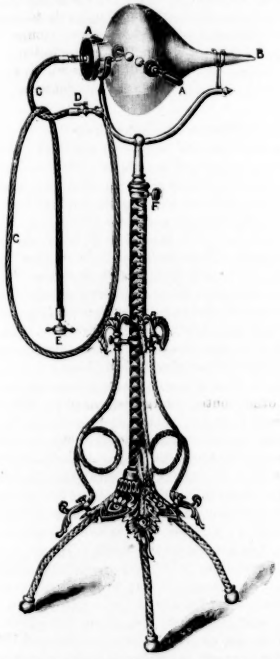
BY CYRUS EDSON, M.D.
NEW YORK CITY.

In describing this new instrument, which I have devised for the purpose set forth in the foregoing title, the adjective "scientific" has been used in order to distinguish the apparatus from the numerous so-called "ozone inhalers" with which physicians and the laity are confronted in advertising columns and on every hand—nostrums which develop so little ozone that chemic means have never been able to detect it. In point of fact, the word "ozone" has been so abused by misuse in connection with inhalers that it has come to mean something physicians view askance. This ozone inhaler was suggested to me by a conversation with a medical friend who told me of a

series of cases of phthisis pulmonalis treated by him that were greatly benefited by nhalations of ozonized air. These patients had been made to inhale the air acted on by the discharge between the poles of a static machine.

The familiarity of physicians with the properties of ozone makes it quite unnecessary for me to enter upon a dissertation respecting the antiseptic and disinfectant qualities of ozone. It may be well, however, to point out the fact that the beneficial effect of climatic change to regions abounding in pine forests in cases of respiratory diseases due to germ infection, is generally ascribed to the presence of ozone in the air of such localities in greater amount than elsewhere.

The ozone inhaler is well shown in the accompanying cut. Two terminals or poles (A A) are passed into a glass receiver, about a foot wide in its greatest diameter, through holes bored in the glass for this purpose. These poles are so constructed



as to be separated or approximated at the will of the operator and are connected with the poles of a static machine by means of insulated wire, just as the Crooke's tube for X-ray work is connected. One wire carries the current from the positive and the other from the negative pole of the machine. An apparatus capable of throwing at least a six-inch spark is best adapted for the purpose. The glass receiver has two large openings, one of which is terminated in a mouthpiece (B), while the other is connected by means of rubber tubing (C) with an air-tank containing air under pressure. The rubber tubing is furnished with a stopcock (D) for the purpose of regulating the supply of air. The inhaler may, however, be used without this air-supply. When used with it, the stream of air enters the apparatus in such a way as to pass directly between the poles or terminals inside the receiver, and thence on through the mouthpiece, to be breathed by the patient. When in operation, the current is seen passing through the space between the two terminals in the form of a silent discharge spray or a stream of sparks, depending on the separation or approximation of the poles. The amount of ozone developed is directly under control of the operator. The silent discharge when the poles are widely separated effects the development of the maximum amount of ozone, while the amount lessens as the poles are approximated. The ozone admixture may be further controlled by regulating the air supply from the air-tank to the receiver. The amount taken by the patient may be still further graduated by having him inhale the stream of ozonized air as it issues from the mouthpiece, his face being at a greater or less distance from it, or by having him apply his lips to the mouthpiece, thereby drawing the admixture of air and ozone directly into the respiratory tract.

In using ozone as a remedial means in the great quantity capable of being furnished by this apparatus, we must bear in mind that it is an exceedingly powerful and active agent, having stronger affinities than oxygen, rapidly destroying all forms of bacterial life. In comparatively weak admixture with air, it is very irritating, and should be inhaled with caution. The strength of the ozonized air should be carefully regulated to suit each case or violent coughing and strangling will follow its respiration. With a little care, however, commencing with a very weak admixture and increasing its strength gradually until very slight irritation is apparent, then decreasing a little to the point of tolerance, it can be safely administered. Its beneficial effects are almost immediate. Cough and expectoration are rapidly diminished and a marked general improvement follows.

I have noted also that the appetite of persons in health to whom the inhalations were given for experimental purposes, was increased; the action of the heart became stronger; the face flushed, and the effects noted after administration of oxygen were apparent. It is too early yet to report cases upon which this treatment has thus far been tried. Suffice it to say that I have used it both alone and as an adjuvant to other treatment, in a number of cases of phthisis and of bronchial catarrh, and am more than pleased with the results. I hasten to give the ozone inhaler to the profession, well knowing that it will appreciate the device to be valuable, since its operation and application are founded upon sound principles.

Before closing, I would add that I have modified the apparatus so as to apply a similar device to the purpose of furnishing quantities of ozonized air to hospital wards, dwellings, theaters, etc. The object of this is to revivify the atmosphere of such places. I believe it of importance that the air in wards of contagious-disease hospitals be kept fresh by this means. Benefit to the patients suffering from diphtheria and other contagious diseases must necessarily follow, if not directly from remedial effect of ozone operating as a bactericide, at least as a result of improvement of the air-supply furnished for breathing.

As in the case of the inhaler, the ozone admixture can be regulated and supplied in any effective strength, while the cost of application in this electric age will be inconsiderable after the apparatus has been once introduced.

Messrs. Van Houten & Ten Broeck of 300 Fourth Avenue, New York City, have constructed the inhaling apparatus after my designs, and caused the cut shown here to be made.

20 West Forty-eighth Street.

RAMAUGE'S NEW INTESTINAL COUPLER.

A. Ramauge of Buenos Ayres again presents a device for an improved button (*Semana Mèdica*, September 1). A cylindric tube 2 c.m. long by 1 wide, is finished at each end with a circular rim projecting 1 cm., thus making the total diameter of the button 3 cm. The edge of these rims toward the centre of the tube slopes from the outside in so that the

outer edges of the rims are much nearer together than the part close to the tube, thus forming a couple of partly enclosed canals encircling the tube, while the surface of the tube is left exposed between them. This exposed space is studded with small holes. These partly enclosed canals are packed with compressed sponge forming a couple of sponge rings around the tube held in place by the overarching rim at each end. Some water is then introduced into the two ends of the intestines and a draw-thread run around each edge. The button is then inserted and the threads drawn tight, thus fastening the intestine around the free space in the center of the tube. The water is then made to flow down to the spot and as it finds its way through the small holes the sponge begins to swell and gradually compresses the two ends of the intestine together, above the threads, until they become consolidated in the peripheral line of the serous surfaces in contact, while the central part will slough away and release the button. No actual tests of the button had been made at the time of his communication.

NECROLOGY.

C. S. Arthur, M.D., Portland, Ind., October 17.——John H. Benedict, M.D., Danbury, Conn.——William Bigham, M.D., Seville, Ohio, October 13.——N. T. Bornar, M.D., Gainesville, Texas, October 9.——Henry M. Boyers, M.D., Grafton, W.Va., October 14, aged 27 years.——Samuel Creadrick, M.D., Philadelphia, October 19, aged 57 years.——D. H. Dickinson, M.D., Topeka, Kan., October 18.——Richard Dingee, M.D., Newportville, Pa., Jefferson Medical College, 1860, aged 70 years.——John B. Fares, M.D., Romeo, Mich., Rush Medical College, 1884, October 14, aged 69 years.——Henry Geiger, M.D., University of Heidelberg, 1861, October 15.——Hezekiah Gilbert Leigh, M.D., Petersburg, Va., October 17, aged 65 years.——Charles McCulloch, M.D., Albany, N. Y., 1877, October 15, at Gloversville, N. Y., aged 50 years.——G. W. Mills, M.D., Sedalia, Mo., October 16, aged 46 years.——W. N. Plank, M.D., Deer Creek, Ind., October 11, aged 45 years.——Peter A. Rivard, M.D., Rochester, N. Y., October 19, aged 46 years.——John Garson Stuart, M.D., Fortville, Ind., October 11, aged 73 years.——W. E. Swanston, M.D., Devil's Lake, N. D., October 14.——R. M. Wigginton, M.D., Waukesha, Wis., October 16, aged 60 years.

DEATHS ABROAD.—Max Wiener, professor of obstetrics at Breslau.——Karl von Mettenheimer of Schwerin.

DONALD A. TAYLOR, M.D., acting assistant-surgeon at Fort McPherson, died of peritonitis, October 15, aged 25 years. The Doctor was a graduate of the University of Virginia. At a meeting of the medical staff of the United States General Hospital at Fort McPherson, Ga., held on Oct. 16, 1898, the following resolutions were adopted:

WHEREAS, It has been our sorrow to lose from our midst our friend and colleague, Dr. Donald A. Taylor, Acting Assistant-Surgeon, U. S. A., and,

WHEREAS, His premature death has been in consequence of disease contracted in the faithful performance of his duties,

Resolved, That we, the members of the medical staff of the United States General Hospital, Fort McPherson, Ga., do hereby express our esteem of our late friend and colleague, and our regret for his sudden loss.

Resolved, That a copy of these resolutions be sent to the family of our deceased colleague, in expression of our heartfelt sympathy with them in their bereavement; and further be it

Resolved, That copies of these resolutions be furnished to the following journals for publication: The *Army and Navy Register*, The *Army and Navy Journal*, The JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, The *Atlanta Constitution*.

[Signed] For the staff:
WALLACE NEFF,
Major and Brigade Surgeon, U. S. V.
CHARLES E. B. FLAGG,
Captain and Assistant-Surgeon, U. S. A.
J. C. GARLINGTON,
Acting Assistant-Surgeon, U. S. A.

PUBLIC HEALTH.

Toxicity of Woman's Milk with Diphtheria.—The *Arch. Clin. de Bordeaux* for August reports a case of severe diphtheria not treated with serum, in which tests of the milk even late into convalescence proved that it was toxic for guinea-pigs, hence would have proved toxic for her infant had she been allowed to nurse it.

Governmental Research on Malaria.—The London *Lancet* announces that a commission for investigating the various questions associated with malaria, which has been appointed by the Colonial Office and the Royal Society, consists of the following members: Dr. C. W. Daniels of British Guiana; Dr. S. R. Christophers of University College, Liverpool; and Dr. J. W. W. Stephens, John Lucas Walker student in Pathology in the University of Cambridge. Drs. Christophers and Stephens will proceed almost immediately to Pavia to work in the laboratory of Professor Golgi and thence to Rome to work in Professor Cetti's laboratory. The Commission will eventually proceed to Africa, when its first work will in all probability be to determine the clinical varieties of malarial fevers occurring there.

Sodium Sulphocarbolate in Scarlet Fever.—J. J. Gonzales describes (*Cronica Médica Mexicana*, October 1), his success in preventing contagion of the other children in a family when one child was infected with scarlet fever during a recent severe epidemic. The isolation was very incomplete, if attempted at all. His dose was 30 cgm. a day for children under 3 years of age; 50 cgm. for children from 3 to 10 and from this to 1 gm. for older persons, administering it for more than a month and thus entirely preventing contagion in seventeen families and a hospital, protecting 139 other children exposed. Two cases of contagion occurred, one showing evidences of the disease a few hours after commencing the sulphocarbolate, and the other having refused to take it at all. It was tolerated perfectly in every case with no after-effects of any kind.

Yellow Fever.—The dispatches since our last report (vide JOURNAL, p. 998), are as follows: October 18, New Orleans, 2 new cases and 1 death; Wilson, 4 new cases; Franklin, 1; Jackson, Miss., 4 and 1 death; Yazoo City, 4; Waveland, 1; Madison, 2; Hattiesburg, 2 and 1 death; Poplarville, 6 new cases; Starkville, 1; Edwards, 5; Natchez, 3; Orwood, 4; Harriston, 2. Frost throughout the fever belt gave promise of a decrease in the fever, but October 19 Jackson reported 6 new cases; Natchez, 4; Madison, 5; Canton, two suspicious cases; Hattiesburg, 2 new cases and 1 death; Oxford, 4 new cases. Quarantine restrictions in Northern Alabama were removed on this date. On October 20, but 1 new case was reported at Jackson, Miss.; 3 and 1 death at Yazoo City; 2 and 1 death at Hattiesburg; 1 at Harriston; 1 death at Warren, Ohio; 3 new cases and 3 deaths at New Orleans. October 22 dispatches reported frosts through the infected districts generally, while quarantine in Mississippi was removed. All traffic restrictions being removed in Louisiana trains began running regularly October 24.

Sero-diagnosis of Leprosy.—Professor Spronck of Utrecht announces that Hansen's bacillus can be cultivated on glycerinated and neutralized potato (10 days, 38 degrees C.) and continues to flourish transferred to Loeffler's gelatinized horse serum or, even better, simple fish bouillon (cod or turbot). Artificial culture produces a modified form of the lepra bacillus, resembling more the diphtheria and pseudo-diphtheria acilli than the Koch bacillus. It is not pathogenic for animals. It is very seldom that the serum of a non leprous person will cause agglutination even at 1 in 30 to 1 in 40, but in every one of the twelve cases of leprosy he examined, agglutination was produced with 1 in 60 to 1 in 1000, except in three cases of anesthetic leprosy dating from fifteen to thirty-two

years, which required 1 in 20 to 1 in 40. The leprous serum will retain its agglutinating power six weeks if 1 per cent. phenicated bouillon is added and air and light kept out. Dried, it retains the agglutinating power a month at least. Living recent cultures must be used for the sero-diagnosis.—*Semaine Méd.*, September 28.

Malt Soup for Infants.—The Breslau University children's clinic has long been investigating to discover a food adapted to cases with gastro-intestinal disease, and reports in the *Deutsche Med. Woch.* of September 28 the extremely satisfactory results attained with a food made of 50 grams wheat flour stirred in one-third of a liter of cow's milk, and worked through a sieve. In another bowl 100 grams malt extract are dissolved in two-thirds of a liter water at 50 degrees C., and to this is added 10 c.c. of an 11 per cent. solution of potassium carbonate. The malt extract mixture is then stirred into the flour-milk and the whole cooked together. A table of the gain in weight in 28 cases is appended (all less than six months old), which averages very high under the circumstances, 43 grams a day in one case, fed on the malt soup 31 days. None of the children had severe rachitis afterward. The article concludes with an appeal for more children's hospitals, as the benefits to infants of scientific treatment and diet far outbalance the burden of the extra responsibility they would entail.

The Plague in Vienna.—The press dispatches of the 23d announce that the plague situation in Vienna continues extremely critical, the death of Dr. Mueller, on this date, adding to the already great alarm that the city will not escape the plague. Dr. Mueller attended Herr Barisch, the surgical assistant at Professor Nothnagle's bacteriologic establishment, who died on Tuesday. Great precautions have been taken to prevent infection from the dead and sick. Dr. Mueller recently returned from Bombay, where he studied the plague and brought with him some of the bacilli. He cultivated the bacilli and Professor Nothnagle and he have been experimenting with them on lower animals with a view to obtaining a serum with which to inoculate against the plague. The man Barisch was a servant in the laboratory, which he kept clean. He also fed the dogs, cats, rabbits, and guinea-pigs on which Professor Nothnagle experimented with the plague bacilli. When Barisch was taken ill he was removed to the Vienna General Hospital, where the physicians, learning his last and dangerous occupation, isolated him. Dr. Mueller then attended Barisch. When Barisch died a bacteriologic examination proved him a victim to the dread disease.

Prevention of Epilepsy.—Children react with convulsions to so many slight causes, gastro-intestinal disorders, fright, etc., that they are always standing on an inclined plane as far as these reflex phenomena are concerned, and each attack progressively increases the danger of epilepsy by lowering the "threshold of the neuron." Max Breitung of Cologne asserts that epilepsy should never be allowed to develop, and that the physician of the future will devote much energy to switching off to another track any child that shows the slightest hereditary or acquired tendency to convulsive attacks. This can be accomplished by wise supervision, dietetic and physical measures and moral training at home and in school, avoiding any disturbance of the nervous system, keeping up the reserve of nerve strength and toning up the neurons so that they will subside rapidly into repose after an excitation. As "dietetics of stimulations," he mentions mild electric baths, massage, tepid douches, etc., and muscular exertion, gardening, carpentering, drawing, book-binding, etc. He refers to the bicycle as a wholesome exercise when rationally used "but who uses it rationally? certainly not the bicyclanthropos curvatus of the present day!" He adds that this "Bahnungshygiene," as he calls it, is a seed for the future. "It requires time, but the Eden of Humanity, in which, as gardeners we work, extends timeless before us. Every progress in our science and our art hastens the day when the physician will be the freely chosen guide of mankind."

Not Part of State Quarantine System.—Many complaints are being made concerning the quarantine detention camp at Egmont Key, and almost invariably it is thought that this camp is a part of the Florida quarantine system. This is a mistake, as that camp is a creation of the United States Marine-Hospital Service, is run entirely by the United States Government and is managed and controlled by the Federal authorities. Neither Dr. Porter nor the State Board of Health has anything whatsoever to do with the management of that station. A gross injustice is, therefore, done the State quarantine system and the health officer when the two are confounded. Governor Bloxham has recently been petitioned in respect to the brutal, immoral and indecent environment of that camp, showing that those presenting charges believe it to be a part of the State's health protective system. It is therefore necessary that the attention of the public should be invited to the great distinction between that quarantine camp and the various quarantine stations of our State Board of Health. The Tampa Bay quarantine station, on Mullet Key, is, and has been for eight years, built, operated and controlled by the State Board. The quarantine detention camps at Egmont Key (Tampa Bay) and those near Key West are part of the United States quarantine system, and are entirely separate and distinct from and in no way connected with the State stations.—Jacksonville *Times-Union and Citizen*, October 1.

Sanitary Surgery.—The following appeared as an editorial in the *New York Evening Post* of March 4, 1898:

SANITARY SURGERY.

Attention has recently been called in these columns to the importance of the establishment in the United States of a National health organization, which should be so broad in scope and so wise in detail as to render speedily and practically available to the citizens of the whole country those new measures for the prevention of diseases which science has within the past few years made known. We have deprecated the notion, still prevalent in many minds as a heritage of an earlier day, that quarantine is the be-all and the end-all of national health organizations.

That this suggestion was not premature is attested by the fact now become widely known that the committee of the Senate at Washington, having the matter in charge, has reported favorably, not a bill to create a National health bureau, with all its wide and beneficent possibilities, but a bill to increase the quarantine powers of the Marine-Hospital Service. This bill, known as the Caffery bill or Wyman's bill, gives almost dictatorial powers to the Supervising Surgeon-General of the Marine-Hospital Service in all parts of the country, and, in its recent modifications, sanctions the establishment of a system of annoying espionage upon the State quarantines, largely ignoring the important ends for which a National health bureau is urgently demanded by the medical profession.

This Wyman-Caffery bill seems to have been framed largely from the point of view which dominated the New York quarantine under the redoubtable Jenkins, a few years since, and which was a source of much keen mortification to the medical profession of the country. Apart from the implication which this bill carries, that quarantine is one of the most important functions of a National health organization, its provisions, if legalized, would place grave commercial as well as sanitary interests in the hands of a single individual, who, not inconceivably, might be more a politician than a sanitarian, more concerned in strengthening his service and his following than in fostering conditions of public and private sanitation, which, the world over among civilized people, are tending to reduce quarantine to an entirely subsidiary function.

We do not, of course, in suggesting such a sinister possibility, allude to the present organization of the Marine-Hospital Service. The medical profession is the best judge of the eminence, as a sanitarian, of the present supervising Surgeon-General. They can best judge whether or not his administration has been signalized by absolute devotion to science to the exclusion of all political involvement of the great bureau which he directs. But legislation like this must not be made for a day, but should have in mind all possible personal vicissitudes of administration.

The so-called Spooner bill, now before Congress, providing

for a national health bureau of the wide scope which we have indicated, guards against the abuse of power in quarantine as in other matters of administration, by the creation of an advisory council representing the various parts of the country, which would share with the head of the bureau or commission the responsibilities of critical situations, and secure attention to the often diverse interests of various parts of the land.

It will interest the student of the civilization which this country is evolving, sometimes it seems in very jerky fashion, to see whether the United States, through their representatives at Washington, are to practically ignore the great advance which sanitary science has made within the last two decades, and the high possibilities for the prevention of disease which are close at hand, and revert to such a blind and ignorant reliance as marked the era of sanitary savagery.

MISCELLANY.

An Enormous Brain.—While the average weight of the European brain is 1380 grams, Bismarck's weighed 1867, Cuvier's 1830, Byron's 1807, Kant's 1650, Schiller's 1630 and Dante's 1420. But is weight synonymous with power?

Hernia of the Lung.—There are forty cases on record and Potain adds another, the first observed in the suprasternal region. Tuffier reduced a pneumocele lower down by suturing the pleura in stages, curing the hernia completely, but this would have been impossible in this case, and fortunately the intratracheal tension held it in check.—*Semaine Méd.*, September 28.

Oidomycosis.—The *Vienna klin. Woch.*, of September 29, describes the case of a woman of 64 years with symptoms of acute cystitis and pneumaturia. The urine was found full of thrush flakes, forming a two-inch sediment in a pint glass and quantities still floating. The bladder was washed out twice with a thousandth solution of arg. nitr., which cured the trouble so that the patient did not return. The bacteriologic investigation showed that though the oidomycosis was so pronounced, yet the pneumaturia was due to the presence of the bacillus coli.

Generalised Sclerodermia.—The necropsy of a very severe case of this affection showed the nervous system intact, and the arteriosclerosis noted entirely out of proportion to the severity of the cutaneous lesions. The dermatosclerosis was, therefore, a specific lesion, the direct effect of the cause of the disease, which must be some toxic substance affecting the connective tissue, as the toxins of tuberculosis are supposed to produce the "cutaneous tuberculides," according to a current theory. In fact preceding infective diseases have been noted in sclerodermia: rheumatism, typhoid fever, erysipelas, diphtheria, etc., and in the above case, syphilis.—*Semaine Méd.*, September 28.

Stimulation before Operation.—Before a major operation, Hanks of New York (*Am. Gyn. and Obstet. Jour.*, September) uses the following method of "moderate and judicious stimulation" in all cases: Commencing six hours before the operation, he administers from one to three teaspoonfuls of good whisky in one ounce of hot water every hour until the time for operation, and two hours before the operation he passes into the rectum, "high above the brim, if possible, from one to two ounces of good whisky in four ounces of warm, normal saline solution, adding, when it may be wise, a little tincture of opium." He believes the patients, so prepared, recover more quickly from the ether narcosis, and generally return to complete consciousness in less than one hour.

Artificial Anus in the Symphysis.—Roux of Lausanne cuts out a U shaped piece of bone in the upper edge of the symphysis without disturbing the rectus muscle, and brings a loop of the intestines through the hole in such a way that the vertical proximal intestine fills the upper four-fifths of the U, while the distal intestine is compressed flat in the lower fifth. The loop is then sutured to the bone below and the rectus muscle above. If a neoplasm has to be removed, it is inspected at this time, but not removed until later, after the artificial anus is working perfectly. The bony setting for the anus possesses great advantages. The feces are easily discharged, bending forward, the bandages keep their place better and the subject can conceal his condition much more satisfactorily.—*Cbl. f. Chir.*, from *Revue Méd. de la Suisse Romande*, 1898, No. 1.

To Close Defects in the Skull.—Prof. A. Barth recently announced that a successful bony regeneration of a defect was only to be obtained by supplying calcareous salts for a foundation, which is best accomplished by filling the space with a spongy calcined bone, easily prepared and sterilized. He proved his assertions on animals and in one case of pseudoarthrosis of the tibia—on man. J. Grekoff reports (*Cbl. f. Chir.*, October 1) his success in two children, both extensive defects, one quite ancient. The calcined bone (shoulder blade of a calf) has healed firmly in place (five to seven months) and percussion elicits the normal sound. He recommends the method in high terms to others, advising filling the defect as smoothly as possible, freshening the edges, absolute asepsis and young subjects. No test has yet been made on an adult.

Laryngeal Diphtheria.—In the *Am. Gyn. and Obstet. Journal* for September, Rosa Engelmann presents an analysis of 100 cases of laryngeal diphtheria. She found that sex played an unimportant rôle, although the 100 cases showed a preponderance of males. Age, she considers a decided factor, and the day on which the antitoxin was given had a more appreciable effect on the cases not intubated than on those intubated. In the former, even as late as the fifth and thirteenth days, "surprisingly good results were obtained."

Heliotherapy Founded by Diogenes.—Sir Samuel Wilkes, in the *Practitioner*, announces himself as a follower of the cynic philosopher, Diogenes. He says: "The remedy for consumption is not medicine, but fresh air. In various parts of the globe this may be obtained. Seeing that all the places best fitted for consumptives are blessed with sunshine, it is quite possible that the latter may be one of the conditions favoring recovery; it may be directly destructive to bacilli, as the warmth and the beauties of the landscape brought out by it indirectly excite the interest of the patient and revivify his nervous system. Air and sunshine are the needs of the consumptive; without them no other remedies will succeed. When reading at school of Diogenes in his tub, and the visit of Alexander the Great to him, I thought he was a man of very bad manners in telling the monarch to get out of his sunshine, and it was not until late years that I took a different estimate of the philosopher. After an attack of influenza I went to Worthing to convalesce, requiring air and sunshine. Everything else was put aside for these; they were my only wants. When, therefore, as I sat looking on the sea and basking in the sun, a friend stopped in front of me to talk, he was stripping me of my only shred of comfort, and I exclaimed, 'Get out of my sunshine.' I then discovered the greatness of Diogenes, who evidently knew that the sun was the source of all power."

Serum Treatment with Serum from Convalescents.—Walger reports four cases of abdominal typhus treated with typhus serum, and with such favorable results that he recommends the method to others. He injected 10 c.c., repeating the injection in one case of relapse. Weisbecker has been very successful in cases of measles, scarlet fever, typhus and pneumonia, with serum from a convalescent, and he now reports equally favorable results in thirty cases of diphtheria. One injection is sufficient—from 4 to 6 or from 8 to 10 c.c., according to the age of the child. The serum must be obtained exclusively from diphtheria patients whose disease healed spontaneously, that is, without any injections. The epidemic of diphtheria was exceptionally severe, but with these single injections the mortality was only 12 to 13 per cent. The gen-

eral health improves at once after the injections, the croupy cough is transformed at once into an ordinary catarrhal cough, and a copious perspiration occurs in nearly every case, followed by a falling temperature.—*Munich Med. Woch.*, September 27.

Optic Neuritis and Brain Tumors.—Krauss (*Phila. Med. Jour.*, October 1), in a study on brain anatomy and brain tumors, concludes that optic neuritis is present in about 90 per cent. of all brain tumors, more often in cerebral than in cerebellar, the location of the tumor exerting little influence over the appearance of the papillitis. Over the production of the papillitis the size and nature of the tumor also has little influence, while slow growing tumors are less likely than the more rapid to be accompanied with optic neuritis. He believes it "probable that unilateral choked disc is indicative of disease in the hemisphere corresponding to the eye involved," and considers it doubtful whether increased intra corneal pressure is solely and alone responsible for the production of an optic neuritis in cases of brain tumors.

Stone in the Bladder.—With the belief of many, that recurrence of stone is especially liable to occur after litholapaxy, Cabot (*Boston Med. and Surg. Jour.*, September 29) does not agree. In his experiences, cases of recurrence after litholapaxy have, with one or two exceptions, been due to a general diathesis or local conditions. Recurrence follows the suprapubic operation also, and he concludes from his cases that the constant reappearance of a phosphatic stone in the bladder usually indicates the resistance of some local cause which should be sought and removed." He believes the suprabubic affords the best opportunity for inspection and operative treatment of the condition found. For removal of stone he thinks litholapaxy the safest operation, and usually competent to work a complete cure.

Electricity in Gynecology.—In considering the limited but fairly well defined field in which electricity may be used, not only with safety but also with advantage, Ford (*Medical News*, October 1) includes the following conditions: amenorrhea in young women, not dependent on their anemia, "but rather in connection with plethora, in which there is an undersized or undeveloped uterus due to perimetric inflammations, which have resulted in slight bonds of adhesions about the broad ligaments, cutting off the blood-supply;" amenorrhea following long, exhausting nervous affections, with or without anemia; simple metritis, where ovaries and tubes are not infected; dysmenorrhea dependent on neuralgic tendency or on slight bands of constriction about the Fallopian tubes, without pus formation; hydrosalpinx; subinvolution dependent on infection after childbirth, when there are no pus collections about the tubes or ovaries, and small fibroids in the uterine wall.

New Electric Lighting Filament.—One of the chief difficulties in electric lighting is to find a filament which will emit the light without being itself consumed. A scientific journal reports the discovery of a new substance which appears to have the qualities desired in greater proportion than any yet used. This is called osmium, the densest and most refractory of all metals, being infusible except at the highest attainable temperature. Osmium is found native as an alloy in certain ores of platinum and iridium. It is a hard, bluish gray metal with an extraordinary atomic weight and enormous specific gravity. It is said to be the heaviest substance known. The properties that suggested its use for incandescent lamps are its practical infusibility, and its known resistance to temperatures in which platinum and iridium volatilize and disappear. It is well known that the intensity of light emitted by an incandescent substance increases rapidly with its absolute temperature. By heating osmium in a vacuum with an electric current strong enough to volatilize platinum, it is said to attain a luminosity hitherto unknown, emitting a white light of an agreeable color, but of great intensity.—*Scientific American.*

Spirilla in Pleuritic Exudation.—In a case of pleurisy treated in the military hospital of Munich, Dr. Welke detected very peculiar micro organisms, which he has described in the *Munich. Med. Woch.* A soldier presented symptoms of pleurisy and pneumonia; he suffered from rigors, high fever, pains in the chest, etc.; on percussion there was dulness in the left side; auscultation showed bronchial respiration with rhonchi, and an exploratory puncture gave evidence of highly fetid purulent exudation. Before an operation could be performed a large quantity of this fluid was suddenly discharged through the bronchi, the fever decreased, and the patient recovered, although very slowly. During convalescence, pleurisy of the other side appeared, but passed off in a few days. In the fluid obtained by the puncture, Dr. Welke discovered, in addition to leucocytes and streptococci, a great number of filiform micro-organisms which were extremely motile, displacing the leucocytes in the course of their movements. Some of them had a fusiform process at each end, and their length was from 100 to 140μ ($\frac{1}{250}$ to $\frac{1}{180}$ in). By and by, their motility became less and stopped altogether in from twenty five to thirty minutes, when the pus had become cold. The fluid discharged through the bronchi could not be examined until after the lapse of two hours, by which time the organisms were, of course, dead. It was not found possible to classify the organisms; their great strength proved that they did not belong to the bacilli, and Professor Hertwig, to whom they were shown, believed them to be either spirilla or protozoa. How they had come into the pleuritic exudation could not be ascertained; probably they had made their way into the pulmonary abscess during the act of inspiration, and finding this medium favorable to their development they had increased very rapidly.—London *Lancet*, September 24.

Rape by Boy Between 7 and 14 Years of Age.—If it be conceded, says the court of appeals of Kentucky, in Davidson vs. Commonwealth, Sept. 11, 1898, that the testimony showed that the accused was not 14 years of age, yet clearly showed that he was much more than 7 years old, and that the jury were authorized by the evidence to believe beyond a reasonable doubt that he was physically capable of committing the crime of rape, and that he was mentally capable of understanding that it was wrong to do so, a verdict of the jury finding him guilty of the offense as in this case is sustained by sufficient evidence.

Sufficiently "Visible Mark."—An accident insurance policy contained a provision that it should not cover "any injury, fatal or otherwise, of which there is no visible mark upon the body." The shoulder of the policy holder of the plaintiff in the case of Thayer vs. the Standard Life & Accident Insurance Company, was injured by a fall, causing pain, and depriving him of the use of the arm, but the only visible mark of the injury was a discoloration of the arm and shoulder. A point was sought to be made of this. But, in overruling exceptions to a judgment for the plaintiff, the supreme court of New Hampshire holds that the "visible mark upon the body" required by the policy need not be a bruise, contusion, laceration, or broken limb, but may be any visible evidence of an internal strain which may appear within a reasonable time after the injury is received.

Special Physical Examination Indispensable.—Where a civil service regulation requires an application for appointment to a position of a certain class to be accompanied by a certificate of a practising physician of good repute that he has examined the applicant, and found him free from any physical defect, etc., and a further regulation requires that, "whenever physical qualifications are of prime importance to the proper discharge of the duties in any position, applicants must pass an additional examination as to their physical condition and capacity," the second appellate division of the supreme court of New York hold, in People vs. Gleason, July 23, 1898, that the examina-

tion required by this second regulation must be had under the direction of the civil service commissioners, and that no other method of examination is a compliance with the rules, and it is immaterial that any other physician's certificate may have been accepted by the board as final, such acceptance being a clear disregard of the civil service regulations.

Why a French Physician was Fined.—A physician in France was recently fined, although not very heavily, for refusing to testify in a matrimonial action to the circumstances of an altercation which he had witnessed between the husband and wife on the occasion of a visit which he made to the family in his professional capacity. The quarrel occurred immediately upon his arrival at the house, and he went away without either prescribing or giving any medical advice whatever. For this reason the divorce court held that he was absolved from all obligations of professional secrecy, and was bound to disclose what he saw, just as any non-professional witness would be. He contended, on the other hand, that inasmuch as he had been summoned solely as a medical adviser, his presence at the scene was wholly due to his professional character, and that if he had not been there as a doctor he would not have been there at all, in which event he would have nothing to tell. The smallness of the fine imposed, which was only 10 francs, indicates that the court did not deem his refusal to testify a very heinous offense, and before he was compelled to give the desired evidence the case was settled.—*New York Sun.*

"Deferred Annuities" for Medical Men.—Annuities, so popular among the professions in Great Britain and the Continent of Europe, do not find much favor on this side of the water. In addition to this being the case as to regular annuities, whereby a certain sum is paid down in cash for an annuity to commence its year at once, "deferred annuities" are rarely if ever heard of in America, although they have been adopted to a great extent in Europe and are readily obtainable from life companies here. A "deferred annuity" is one under the condition of which the yearly payment commences early in life, and the annuity does not go into effect until, say, ten, twenty or thirty years have elapsed. The American companies, however, make very little mention of them in their circulars and manuals, and therefore even a well-informed agent connected with one of our life companies may be excused for not being informed on the subject.

The "Camp Ghost" at Camp Wikoff.—The following sketch of the physical human wrecks that were so numerous at the Montauk recuperation camp appeared in a New York Journal: "The most pitiable sight that is to be seen at camp, outside of the hospitals, is the 'ghost' type. The 'camp ghost' is the man who is not ill enough to be admitted to the hospital, but is too weak to do duty. He has nothing to do but wander, and he really lacks the strength for this, but he always essays it, with the result that he drops by the wayside and lies until a jolting army wagon or hospital conveyance picks him up. Or, feeling his energy waning, he essays a short cut over the succession of ground swells that exist here. There was one of the Twenty-Second Regulars whose knees gave out when he was in the hollow between the hillocks one morning. On his hands and knees he crawled through a marsh to the summit of the neighboring hillock and there fainted. Swirling banks of fog were chasing each other over the land, limiting the range of vision to a few yards all the morning, and it was not until noon that two volunteers found him and carried him to the roadway. 'Such cases,' says one of the surgeons here, 'are just about beyond treatment. I have not yet been able to comprehend the condition of mind and body which produces the 'camp ghost.' The cause is the hardships of the Cuban campaign, repeated attacks of fever, and lack of nourishing food at the time when it was most needed. Yet these ghosts are not ill in the ordinary meaning of the term. There is no specific ailment. They are simply devitalized. It is useless to take them into the hospitals. Their best chance is in plenty of fresh air and cheering companionship, although there is little enough of the latter. If we could surround those fellows with the people they love and who love them, we could guarantee 99 per cent. of cures. It would revive their interest in life. As it is, their sad faces are a contagion. They droop a little more each day, until one day they droop into the hospital. The next day they are more than likely to be dead. On the records we put it down as exhaustion, and I guess that is pretty near it; exhaustion of all the vitalizing instincts that bind a man to this earth'."

Temple of Esculapius.—The German archeologists working in Greece have excavated the celebrated Temple of Esculapius on the Island of Paros, described by several Greek authors. It measures 41.25 by 19.5 meters, and is in an excellent state of preservation, though pillaged of all its treasures.

Personal.—Dr. F. E. Waxham of Denver, Colo., has returned to Chicago, with office in the Columbus Memorial building and residence at 3633 Grand Boulevard.

New Publication.—The *Texas Clinic*, Vol. i, No. 1, October, 1898, comes to our exchange table. It is to be published monthly at $1.00 a year, and is edited by J. B. Shelmire, M.D., Dallas, Texas.

Societies.

The following recent meetings are noted:

Illinois.—Æsculapian Society of the Wabash Valley, Paris, October 27; Brainard District Medical Society, Petersburg, October 27; Chicago Gynecological Society, October 21; Military Tract Medical Association, Canton, October 20; Scandinavian Medical Society, Chicago, October 21; Stephenson County Medical Society, Freeport, October 13; Will County Medical Society, Peoria, October 25.

Maryland.—Johns Hopkins Medical Society, Baltimore, October 17.

Michigan.—Saginaw County Medical Society, Saginaw, October 14.

Missouri.—Medical Society of City Hospital Alumni, St. Louis, October 20; St. Louis Medical Society of Missouri, October 22.

New Hampshire.—N. H. Surgical Club and Center District Medical Society, joint session, Concord, October 11.

New Jersey.—Camden District Medical Society, October 11.

New York.—Central New York Medical Association, Auburn, October 18; Jefferson County Medical Society, Syracuse, October 11; Oneida County Medical Society, Rome, October 11; Washington County Medical Society, Whitehall, October 6.

Pennsylvania.—Franklin County Medical Society, Chambersburg, October 18; Lycoming County Medical Society, Williamsport, October 14.

Vermont.—State Medical Society, Brattleboro, October 13 and 14; Vermont Sanitary Association, Montpelier, October 25.

Wisconsin.—Kenosha County Medical Society, October 13; Northwestern Wisconsin Medical Association and Fox River Valley Medical Society, joint session, Oshkosh, October 25.

Cincinnati.

APPOINTMENT.—Dr. Louis Molony has been appointed acting assistant-surgeon in the volunteer army to be stationed in Santiago with Brigade Surgeon Lawrence Carr of this city.

DR. WALLACE NEFF, Brigade-Surgeon U. S. V., has been visited with a severe attack of appendicitis, at his station near Atlanta, Ga. He was attended by Dr. C. A. L. Reed of this city.

OHIO VOLUNTEERS.—The surgeons of the First Ohio Volunteers are busy examining the members of the regiment previous to their mustering out. The soldier makes a written statement of his condition which he signs, answering as to whether he has any physical disabilities, and if so, when, where and how he received them. This is followed, if the man declares that he has any such disability, by the certificate of the company's commander. The man is then examined and the surgeon makes his written report as to the man's condition. Major Hendley is in charge of the examining.

SOCIETY FOR ORIGINAL RESEARCH.—At the regular meeting, October 13, Dr. J. E. Greiwe presented specimens of the various forms of syphilis of the brain and spinal cord.

Baltimore.

MEDICAL SCHOOLS.—The winter sessions of the schools are now in full swing. The University of Maryland and College of Physicians and Surgeons are recovering from the effects of the adoption of the four-year course in 1895, and have increased classes, especially the former. The University is much advanced by the splendid new hospital and its successful school for nurses. Professor Tiffany, who, owing to some disagreement with his colleagues of the faculty, had withdrawn from didactic teaching, has resumed full charge of the chair of surgery. Prof. Hammeter has one of the finest clinical laboratories in the country, and gastric physiology, pathology and therapeutics are demonstrated there in all the fullness of their modern development. There was no formal opening at the University. Prof. Bevan opened the course at the College of Physicians and Surgeons, Prof. Street at the Baltimore Medical, and Prof. Batchelor at the Woman's Medical. I understand the class at the Baltimore Medical is smaller than usual, owing to the four-year rule coming into operation there for the first time with the class of 1896. What is to be the status of our new college, "The Maryland Medical," is only a matter of conjecture. It opened in September with twenty five to thirty students. It has a three-year course, but the sessions are of eight months. The Baltimore University has a supplementary session each year in the spring months. Really the number of schools has multiplied so here that the question of a name is becoming a difficulty, almost all the available terms being already appropriated. We have now here seven "regular" schools, including one for women, one homeopathic school, three dental schools and one college of pharmacy.

OPENING ADDRESS.—The medical event of the week has been the address of Prof. T. Clifford Albutt, of Cambridge University, at the opening of the Johns Hopkins. Prof. A. is returning home from the Pacific Coast, where he has been delivering a series of lectures. The address was largely technical. There were many non-medicals in the audience, including ladies. The Johns Hopkins opened with 207 students, a larger number than ever before. This is the seventh session. There were no graduates until the fifth session, no students being admitted to advanced standing. There are now thirty-five women in attendance, nine being new students. The first year class numbers sixty-six. The new buildings of the medical school are approaching completion and will be occupied during the present session. The hospital occupies four squares, but the college buildings occupy another entire square. Prof. Osler has been quite ill since his return from Scotland, where he went to receive the degree of LL.D. He has been suffering from influenza which led to pneumonia. He has, however, recovered sufficiently to leave the city and is now recuperating in the mountains of Pennsylvania. He expects to return and assume the duties of his chair and deanship on November 1.

CENTENNIAL.—We are looking forward to a great occasion next year when we will celebrate the centennial of our Medical and Chirurgical Faculty. One hundred years ago the society was chartered by the Legislature of the State and given control of professional interests in Maryland. One hundred and one physicians, representing all the counties of the State, were named as incorporators in the charter. Organization was effected at Annapolis, June 2, 1799, the first president being Dr. Upton Scott of Annapolis, an Irish physician who came over with Governor Sharpe in 1753. Prof. Samuel C. Chew holds the office this year, having been selected as above all others in the State fitted to fill the chair during the centennial year by reason of his high standing, his ripe scholarship and his dignity. The semi annual meeting of the faculty will be held next month in Frederick City, Md. Through the generosity of the Messrs. Frick the medical library has made great strides the past two years and now has a really fine collection of books available. It is especially rich in those departments in which Prof. Charles Frick was interested—fevers, renal, nervous and intestinal diseases.

Washington.

ST. ELIZABETH'S HOSPITAL.—The report of Dr. W. W. Godding, the surgeon-in-chief of the Government Hospital for the Insane, for the year ended June 30, 1898, shows there were 1767 patients at the close of the last fiscal year; 437 were admitted during the present year, making a total of 2204 patients treated; of this number 351 were discharged, 93 recovered, 49 improved, 3 were not insane, and 197 died. The general summary shows that 32.28 recovered, 16.26 improved, 2.39 were unimproved, and 31.87 died. Since the opening in 1855, 10,772 cases have been treated, of which number 3478 recovered, 1749 improved, 3433 died, and 2726 were unimproved. The daily average of inmates during the present year was 1798, an increase of 88 over the preceding year. He asks for additional space and an increase of appropriation to care for the large number of patients, which have come to the hospital as a result of the Spanish-American war, and recommends a change in the existing laws governing the commitment of the insane patients. As a result of an increase of 20 per cent of patients during the past year, he asks for deficiency appropriation of $12,000 in order to settle last year's accounts.

MICROSCOPIC SOCIETY.—At a recent meeting the following officers were elected: President, Dr. H. H. Robbins; vice-president, Prof. Hall Bartsch; corresponding secretary, H. H. Doubleday; recording secretary, L. M. Morers; treasurer, Dr. Robert Reyburn; curator, W. H. Seaman. A committee was appointed to draft suitable resolutions on the death of Dr. Edwin A. Gibbs, a member of the Society.

CLINIC PATHOLOGICAL SOCIETY.—At the meeting of the society, on the 18th inst., the following officers were elected: President, Dr. John Van Rensalaer; vice-presidents, Drs. John R. Wellington and Sterling Ruffin; recording secretary R. T. Holden; corresponding secretary, J. T. Kelly; treasurer Frank Leach.

HEALTH OF THE DISTRICT.—The report of Health Officer Woodward for the week ended October 15, shows the total number of deaths to have been 100, of which number 60 were white and 40 colored. At the close of the week there were 131 cases of diphtheria and 90 of scarlet fever under treatment. The annual death-rate for the whites was 16.29, and for the colored 23.43. There were 5 fatal cases of typhoid fever, 6 of diphtheria and 1 of scarlet fever. There were 125 births, of which 99 were white and 26 colored. Dr. A. Barnes Hope has been appointed a physician to the poor, to act during the illness of Dr. William G. Morgan.

EPISCOPAL HOSPITAL.—At the recent quarterly meeting of the Eye, Ear and Throat Hospital, it was announced that Bishop Satterlee had set aside the last Sunday in October as hospital Sunday, and that all collections on that day, in the local churches would be donated to the hospital fund; the Directors are endeavoring to secure an endowment of $50,000. The total number of patients treated during the past nine months, ended September 30, was 1027, 553 white and 474 colored. One hundred and thirty-six patients have been received into the Hospital; 173 operations have been performed; $998 has been received for pay patients.

UNLICENSED DENTISTS FINED.—A Dr. Crosby, who was tried and convicted on the charge of violating the law regulating the practice of dentistry, by engaging in practice without a license, was fined $50 by the judge of the police court. The local dentists are highly gratified by the enforcement of the law. So far, they have been much more successful in enforcing their Act than the doctors have in enforcing their regulation.

Philadelphia.

CONTRIBUTIONS FROM THE PUBLIC SCHOOLS.—Although members of the medical profession are constantly doing little acts of charity for which there is seemingly no recompense, the good seed sown must surely bring forth its just reward. An example of what this means in dollars and cents, is seen in the penny contributions of school children for the benefit of sick soldiers in the different hospitals of this city and to be distributed as follows: Medico-Chirurgical $584.80, St. Agnes $408, University $248.90, Presbyterian $152.35, St. Joseph's $145.55, German $163.20, Episcopal $115.60, St. Mary's $58.50, Jefferson $138.75, Hahnemann $81.60, Polyclinic $40.80, St.

Timothy $8.18, Samaritan $8.18, Women's Homeopathic $54.40, Methodist $36.75, other hospitals $76.20. Total $2,338.11.

SICK SOLDIERS.—There have been treated in all the hospitals of this city a total of about 2500 sick soldiers. Since September 12, Maj. D. C. Peyton, a brigade surgeon, has had full charge of the work here and has a corps of eight assistant surgeons to transact the business necessarily entailed upon that department. The following is the method of caring for the convalescents, according to the *Ledger:* "Men discharged from the hospital report first to the office with their hospital certificate, stating that they are convalescent. They are then given sick furlough and sent to the quartermaster, who furnishes transportation and commutation of rations at the rate of $1.50 a day for the time necessarily taken in traveling to their homes. If a soldier is weak and has some distance to go, the quartermaster, on certificate from the surgeon's office, furnishes sleeping car accommodations. If in need of clothing, he is furnished what is needed from the quartermaster's department on request of a surgeon. When hospitals notify the surgeon's office that certain soldiers are ready to be discharged, clothing is procured for them through the quartermaster's office and this is in many cases sent direct to the hospital, so that it is ready when discharge from the hospital is given.

MEMORIAL TO DR. JOSEPH LEIDY.—At a recent meeting of the Academy of Natural Sciences of Philadelphia, Dr. Edward J. Nolan presented a memorial of the late Dr. Joseph Leidy. The gift consisted of five volumes containing drawings and writings by that author. Dr. Leidy at one time practised medicine in this city and for several years was professor of anatomy of the University of Pennsylvania, where he was much esteemed by the faculty and students. He is probably best known for his studies in the lower forms of animal life, comparative anatomy, and for his able and painstaking work of estimating the ages of stalactites and stalagmites of the Luray Cave, Virginia. Dr. Leidy was a thorough scientist, investigator and teacher, and his fame extends throughout the world.

LECTURE BY DR. ALBUTT.—Dr. Thomas Clifford Albutt, who has been traveling quite extensively in America and who occupies the chair of the theory and practice of medicine at Cambridge University, recently lectured to the graduating class of the University of Pennsylvania. The speaker was introduced by Dr. James Tyson, who lectured upon "Diseases of the Arteries in Association with Apoplexy." Dr. Albutt recently arrived from Baltimore, where he was the guest of Professor Osler of the Johns Hopkins University.

HOMEOPATHS WANT INSANE HOSPITAL.—At a meeting of the Homeopathic Medical Society of this city, at which time it is stated 100 delegates were in attendance, mention was made of the overcrowded condition of the insane asylums of the State of Pennsylvania. As matters now stand, these unfortunates are being cared for by the regular profession to the disadvantage of those who practice according to the tenets first promulgated (but not now practiced) by Hahnemann. In order to correct this discrimination a committee was appointed and instructed to use urgent means to have the subject brought before the proper legislative bodies. We await results.

TESTIMONIAL PERFORMANCE.—Arrangements are being made by members of the Ladies' Aid Society of the Medico Chirurgical Hospital for a testimonial performance for the benefit of the sick soldiers in that institution. The Medico-Chirurgical has shown great enthusiasm in bringing the sick soldiers to the city through the medium of hospital trains, and deserves great credit for the manner in which it has increased its facilities on so short notice. This action, therefore, demonstrates the enterprise and capabilities of the men who comprise its managers and teaching faculty.

WANT OF CO OPERATION.—Some time ago citizens of Germantown held a meeting, at which time a committee was appointed to devise ways and means for the erection of a children's hospital. It is stated, however, in the lay press that letters have been received from residents and business men who were appointed, declining to act as members of the board of directors. It is stated that contribution boxes have been placed in different stores and offices for the benefit of the hospital fund, and committees have been appointed to draft rules and by laws and to procure a charter. Invitations have been addressed to fraternal orders in Germantown asking financial aid for the institution.

EVADING VACCINATION LAW.—The fact has reached the board of health of this city that the compulsory vaccination law regarding school children is being evaded by the wholesale. A resolution has been passed by the board of education asking that the board of health be notified of the "large percentage of non vaccinated children attending the schools, the children having been admitted upon certificates signed without proper evidence." It is further stated that the board of education has passed a resolution that the board of health be requested to disinfect the schools of this district or to provide the means for doing so. The disinfectant which was recommended was chlorid of lime and it was thought best to instruct the janitor in the proper use of this.

ADDITION TO SAMARITAN HOSPITAL.—Owing to the increased amount of work by this institution, the managers have decided to buy the dwelling house adjacent to the property and convert it into a department of the hospital. The entire property has a frontage of fifty feet and extends eastward a distance of 230 feet.

NEW MEDICAL LABORATORY.—Among the many other improvements going on at the University of Pennsylvania, another laboratory is to be built. To stimulate a spirit of friendly rivalry, Provost Harrison submitted the matter to the junior members of the architectural department for a proper design, but the jury of award has so far been unable to decide on whom the honor will be conferred.

VERDICT AGAINST TELEPHONE COMPANY.—Dr. John Marshall, dean of the Medical Department of the University of Pennsylvania, was recently awarded $737 against the American Telephone Company for injuries sustained to shade trees at his summer home. In the construction of a line for the company along the estate some sixty or seventy ailanthus and locust shade trees were destroyed, thus injuring the property.

REPORT OF THE NATIONAL RELIEF COMMISSION.—The National Relief Commission, which has so liberally provided for the sick soldiers in the field and in the hospitals of the different cities, has reported contributions of money and supplies aggregating thousands of dollars. The last report, made public by Mr. George C. Thomas, treasurer, at the banking house of Drexel & Co., is: Cash, etc., $76,631.57; value of supplies to date, $40,325.

MORTALITY STATISTICS.—For the week ending October 22, there were reported to the Bureau of Health a total of 389 deaths, of which 122 occurred in children under the age of 5 years. The total number of deaths is an increase of 58 over that of last week and an increase of 13 over the corresponding period of last year.

SOLDIER PATIENTS.—The government recently transferred twenty five sick soldiers from Camp Meade to this city, where they are being treated at the Woman's Hospital.

SOCIETY FOR FIRST AID TO INJURED.—A society has recently been formed here for the purpose of giving instruction in "home nursing" and to render "first aid to the injured." Lectures will be given at stated times in suitable rooms, both in this city and throughout the State of Pennsylvania.

RECEPTION.—Members of the Philadelphia Medical Club recently tendered a reception to Dr. W. L. Rodman, professor of surgery in the Medico-Chirurgical College. A representative body of physicians attended.

RED CROSS HOSPITAL.—Members of the Red Cross Society of this city have secured a site for a hospital at the corner of Twentieth and Cherry Streets, and are rapidly putting in equipments necessary for the care of patients soon to be admitted. A committee has been appointed, consisting of several physicians and lay members, who will act as the board of managers.

Louisville.

GARVIN.—Dr. Samuel H. Garvin has just been re elected jail physician for the ensuing four years. The place is awarded by vote of the justices of the peace of Jefferson County. Dr. Garvin is a native of Louisville, and has spent the best part of his life in this city. He has served as jail physician nearly twenty-two years, under both republican and democratic administrations. There was but one opposing candidate.

MORGAN.—Dr. L. C. Morgan of Dugansville was the victim of a dastardly attempt at robbery on the 4th inst. While on

his way home from a neighboring town, about 10 P.M., he was decoyed into a house by three negro men, who told him a colored woman was very ill and in need of a physician's services. When the Doctor entered the house the negroes set upon him for the purpose of robbery. The Doctor drew a pistol, but one of his assailants shot him with both barrels of a shotgun before he could make any resistance. He remained conscious long enough to give a description of his assailants, and they are now under arrest and close guard, as there is great talk of lynching.

KOEHLER.—Dr. Henry H. Koehler has announced that his practice will be limited to genito-urinary and skin diseases from this time, with an office at 1001 Fourth Avenue.

JOHNSTON.—Dr. Geo. Ben Johnston of Richmond, Va., en route to the Mississippi Valley Medical Association, where he delivered the address in surgery, was the guest of Dr. L. S. McMurtry at a dinner on the evening of the 10th.

MEDICO-CHIRURGICAL SOCIETY.—This society's membership has been depleted by the death of Dr. John A. Larrabee, and the resignation on account of removal from the city of Drs. Wm. L. Rodman and Jno. L. Howard. Dr. P. L. Butler and Dr. T. C. Evans have been elected for two of the vacancies, and Dr. H. H. Grant is in nomination for the third.

MARVIN.—Dr. J. B. Marvin and family have returned from a three-months' sojourn in Europe.

PHARMACY.—The regular meeting of the State Board of Pharmacy was held in Frankfort, last week, for the purpose of examining applicants for license.

QUARANTINE.—Upon the advice of the State Board of Health, the Commercial Club, one of the principal organizations of business men in the city, has issued a proclamation, inviting yellow fever refugees from the South to Louisville, as was done last year. As a result there has been a great number of the Southern residents in the city during the past three weeks.

CATTLE.—Drs. F. T. Eisenman and J. G. Gashin, respectively State veterinarian and State bacteriologist, have returned from the meeting of the Interstate Association of Live Stock Sanitary Boards, and are preparing their report for submission to the governor, in regard to "ticky" cattle. One of the chief points developed at this meeting was the fact that cattle dipped in dynamo oil and sulphur can be safely mixed with northern cattle, and when inspected by either State or Federal authorities, can be shipped north at any time of the year. It was decided that the open season should extend from November 1 to January 1, when cattle can be shipped north for immediate slaughter. It was determined to ask the Secretary of Agriculture to so change the quarantine laws of Oklahoma, Kansas, Missouri, Tennessee and Texas that cattle from all points below the quarantine line may not be shipped to points above the quarantine line, unless intended for immediate slaughter. The only way cattle may be admitted above the quarantine line is by inspection by Federal and State authorities after being dipped. A resolution in line with the above was sent the Secretary of Agriculture by the Louisville Live Stock Association endorsed by the State Board of Health.

STATE BOARD OF HEALTH.—The State Board of Health held its annual session at the Galt House on the 20th inst., with the following members present: J. M. Mathews, president; J. N. McCormack, secretary, of Bowling Green; J. H. Letcher of Henderson; J. H. Samuel of Maysville and Wm. Bailey of Louisville. The report of Secretary McCormack was a review of the Board and detailed much important work done, characterized by the Secretary as the most active and anxious in the history of the Board. This anxiety was caused by the yellow fever epidemic in the South and the number of refugees passing through the State; the prevalence of smallpox which was so widely epidemic in the State and in separated districts. The inspection service of the Board and disinfection on board trains was reviewed by the report, and the obstacles thrown in the way of the Board by one railroad was mentioned. Attention was called to the fact that the epidemic of smallpox necessarily made a heavy drain on the appropriation of the Board, and that it is practically without funds at present. It was stated that the General Assembly is adding new work to the Board every year, but is making no increase in the appropriation. The increasing prevalence of scarlet fever, diphtheria and typhoid fever was mentioned, and the alarming death rate from these causes, causing more deaths than yellow fever and cholera have in the history of the State. Dr. McCormack commended the work of the State veterinarian in cases of Texas fever, anthrax and glanders which have appeared among the cattle and horses in the State. It was stated that owing to the increase of the routine work of the executive officer of the Board it would become necessary shortly for him to devote his whole time to it. The amount expended by the Board was $3,544.20. Action was taken at this session on the cases of several who have been guilty of unprofessional conduct or quackery in the State. Dr. Adaline Bell of Paris, who appeared before the Board to stand the required examination for candidates to practice osteopathy, had failed to come up to the standard in the subjects upon which she was examined, and she was refused a license. Dr. G. N. Murphy of Bowling Green, who claims to cure what physicians generally recognize as incurable, and guilty of other unprofessional conduct, was represented by an attorney and his case set for hearing on November 7. Mr. Aaron Kohn, attorney for the Board, presented the report as an answer to Harry Nelson, who has been practicing osteopathy. The answer says for the Board that osteopathy is simply a perfected system of quackery and empiricism, and denies that it requires any learning or ability to "become versed in the pretended doctrines" of the system. The reply says that Nelson has never applied to the Board for a license to practice and has refused to submit himself or his qualifications to the provisions of the statute enacted by the legislature. The reply concludes that to allow Nelson to practice would be to sacrifice the lives, health and limbs of the citizens of Kentucky. Notice was prepared to be served on P. H. Woodhull of Bowling Green, also an osteopath, to appear before the Board on November 8, and answer charge of unprofessional conduct. The Board adjourned to meet again on November 7.

CHLOROFORM.—A death from chloroform occurred at St. Joseph's Infirmary on the 20th inst. The patient was a policeman who was to have a toe amputated, and was found in good condition to take an anesthetic, which was administered by the interne of the hospital. There was a prolonged stage of excitement and much struggling and the patient died in this state before the operation had been begun.

DRUGGISTS.—Several of Louisville's retail druggists have just returned from St. Louis, where they attended a meeting at which the National Retail Druggists' Association was organized. The Louisville druggists represented the Louisville Botanical Association and the Kentucky Pharmaceutical Association. One of the representatives, in an interview, stated that much was done at the meeting which would aid the druggists of this city in getting away from the cut-rate business, which has demoralized the retail drug trade in the past two years. Resolutions were adopted calling upon manufacturers to cease selling to department stores, to rabid cut-rate druggists and to retailers in large quantities. They also requested the assistance of all retailers and jobbers and manufacturers in having the medicine tax remitted, or if that be not possible, to have the Government remit the tax on such simple remedies as druggists may put up themselves according to public formulæ. This meeting was held at the time the Wholesale Druggists' Association and National Proprietary Medicine Manufacturers were in session, yet the roll call showed twenty-one States represented and about 150 in attendance.

THE PUBLIC SERVICE.

Movements of Army Medical Officers.—The following named officers have been ordered to duty in connection with the mustering out of volunteer commands: Major Ezra Woodruff, surgeon U. S. A., Ft. Trumbull, Conn., for Rhode Island Vols.; Major Augustus A De Loffre, surgeon U. S. A., Austin, Texas, for Texas Vols.; Major Charles K. Winne, surgeon U. S. A., Ft. Crook, Neb., for Nebraska Vols.; Major W. F. de Niedeman, brigade surgeon U. S. V., to Jefferson Bks., Mo., for the 1st Missouri Inf.; Major Timothy E. Willcox, surgeon U. S. A., to New York City, for New York Vols.; Major Louis W. Crampton, surgeon U. S. A., Ft. McHenry, Md., for the 5th Maryland Inf.; Major Geo. W. Crile, brigade surgeon U. S. V., from Cleveland, Ohio, to Ft. Sheridan, Ill., for the 1st Illinois Cav.; Major Elmer E. Heg, brigade surgeon U. S. V., from the general hospital, Ft. Myer, Va., to Omaha, Neb., for the 2d Neb. Inf.; Major John P. Dodge, brigade surgeon U. S. V., from Camp Wikoff, Montauk Point, L. I., to Columbus, Ohio, for Ohio Vols.; Major Eugene L. Swift, brigade surgeon U. S. V., from Camp Wikoff to Concord, N. H., for New Hampshire Vols.; Capt. Chas. Willcox, asst.-surgeon U. S. A., to Columbia, S. C., for South Carolina Vols.; Capt. Chas. Lynch, asst.-surgeon U. S. A., from Camp Frank Ardmore, Ind. Ter., to Little Rock, Ark., for the 1st Arkansas Inf.; Capt. Henry D. Snyder, asst.-surgeon U. S. A., from Ft. Ethan Allen, Vt., to Burlington, Vt., for Vermont Vols.; First Lieut. Weston P. Chamberlain, asst.-surgeon U. S. A., from the general hospital, Ft. Monroe, Va., to Richmond, Va., for the 3d Virginia Inf.; and Acting Asst.-Surgeon Alexander McF. McMasters, his orders to Cuba being revoked, to Philadelphia, Pa., for Pennsylvania Volunteers. Capt. Francis A. Winter, asst.-surgeon U. S. A., and Acting Asst.-

Surgeon S. M. Long from Camp Wikoff, Montauk Point, L. I., to New Haven, Conn., for Connecticut Vols.; Capt. Wm. F. Lewis, asst.-surgeon U. S. A., from Huntsville to Montgomery, Ala.; Capt. C. E. B. Flagg, asst.-surgeon U. S. A., from Ft. McPherson, Ga., to Montgomery, Ala., and Acting Asst.-Surgeon Robt. N. Pitts, now at Montgomery, Ala., for Alabama Vols.; Major Jas. M. Jenne, chief surgeon of volunteers, from St. Albans, Vt., and Capt. Geo. J. Newgarden from Ft. Adams, R. I., to Boston, Mass., for Massachusetts Vols.; Major Chas. R. Parke, brigade surgeon volunteers, from Camp Meade, Middletown, Pa., to Augusta, Me., and Capt. H. R. Stiles, asst.-surgeon U. S. A., to Ft. Preble, Me., for the 1st Maine Inf.; Major Robert Burns, brigade surgeon volunteers, to Concord, N. H., for New Hampshire Vols. Lieut. Samuel M. Waterhouse, asst.-surgeon U. S. A., to Ft. Logan H. Roots, Ark., for the 1st Arkansas Inf. Acting Asst.-Surgeon Arlington Pond from Ft. Myer, Va., to Richmond, Va., for the 3d Virginia Inf.

Relieved from duty with field commands and ordered to posts: Lieut.-Col. Benjamin F. Pope, chief surgeon U. S. V., to Columbus Barracks, Ohio; Major Chas. L. Heizmann, surgeon U. S. A., from Camp Wikoff, N. Y., to Fort Adams, R. I.; Major Henry S. Kilbourne, surgeon U. S. A., to Madison Bks., N. Y.; Major Marshall W. Wood, surgeon U. S. A., to Fort Douglas, Utah; Major Rudolph G. Ebert, surgeon U. S. A., to Vancouver Barracks, Wash.; Major W. C. Burden, brigade surgeon U. S. V., to Washington Barracks, D. C.; Major Walter D. McCaw, brigade surgeon U. S. V., to Fort Porter, N. Y.; Major Francis J. Ives, brigade surgeon U. S. V., to Willets Point, N. Y.; Major Guy L. Edie, brigade surgeon U. S. V., from the 1st Army Corps at Lexington, Ky., to the Presidio, San Francisco, Cal.; Major Chas. B. Ewing, brigade surgeon U. S. V., to Fort Brady, Mich.; Majors Aaron H. Appel and Paul Shillock, surgeons U. S. A., to Fort Grant, Arizona; Major Eugene L. Swift, brigade surgeon U. S. V., from muster-out duty in New Hampshire to Fort Monroe, Va.; Major Louis S. Tesson, U. S. A., to Fort Ethan Allen, Vt.; Capt. Henry R. Stiles, asst-surgeon U. S. A., to Fort Preble, Me.; Capt. Geo. J. Newgarden, asst-surgeon U. S. A., to Fort Adams, Vt., and the following acting asst-surgeons: Joseph N. Heller from Camp Wikoff, N. Y., to Fort Ethan Allen, Vt.; Otto C. Heise and Milton D. Norris from the Sternberg Hospital, Chickamauga Park, Ga., to Jefferson Barracks, Mo.; and James T. Arwine to Fort Ringgold, Tex.

To Camp Meade, Middletown, Pa.: Major Junius L. Powell, surgeon U. S. A., from Camp Wikoff, N. Y., and acting assistant-surgeons Wm. Alden from Portland, Me., and Dwight B. Taylor from Camp Poland, Knoxville, Tenn.

To the 7th Army Corps, Gen. Fitzhugh Lee, Jacksonville, Fla.: Major W. Fitzhugh Carter, surgeon U. S. A., from the 4th Corps at Fernandina, Fla., and the following acting assistant-surgeons: Geo. G. Chaims and William S. Terriberry from Washington, D. C., John D. Thomas from Charleston, S. C.; Frederick R. Dolson from Fort St. Philip, La.; John Lyng from Kensington, Minn.; Thomas R. Marshall from Camp Wikoff, N. Y.; Thomas Y. Aby from Fort Lawrence, Kas., and William E. de Salazar from New York City.

To Camp Poland, Knoxville, Tenn.; Major Adrian S. Polhemus, surgeon U. S. A., and acting asst.-surgeons John B. Alcorn and Hyman Finkelstone from Washington, D. C.; William P. Lawrence from Nashville, Tenn., and John B. Hallwood from New York City.

To duty with troops at Camp Hamilton, Ky.: Major John M. G. Woodbury, chief surgeon U. S. V.; Acting Asst.-Surgeon James W. Maddox from the Fort Thomas General Hospital, Ky.

To the General Hospital, Fort McPherson, Ga.: Acting Asst.-Surgeons Ernest W. Fowler, Robert C. Rind and Victor E. Watkins from the Sternberg Hospital, Chickamauga, Ga.

To the General Hospital, Fort Thomas, Ky.: Acting Asst.-Surgeon Arthur E. Smith from Ravenna, Ohio.

To duty with troops at Huntsville, Ala.: Major R. J. Gibson, surgeon U. S. A., from Fort Meade, S. D., to the 8th U. S. Cav.; Lieut. Guy C. M. Godfrey, asst.-surgeon U. S. A., to the 10th U. S. Cav.; Lieut. Albert E. Truby, asst.-surgeon, U. S. A., to the 8th U. S. Inf.; Lieut. James M. Kennedy, asst.-surgeon U. S. A., to report to the commanding general; Acting Asst.-Surgeon Wm. B. Winn from Fort Niagara, N. Y., to the 8th U. S. Cav., and the following acting asst.-surgeons to report to the commanding general: A. H. Simonton from Camp Wikoff, N. Y., and Chauncey T. Scudder and G. J. de Quesada from Washington, D. C.; T. H. Landor from the Sternberg Hospital, Chickamauga Park, Ga., and W. C. Douglas from Camp Wikoff, Montauk Point, L. I.

To the Josiah Simpson General Hospital, Fort Monroe, Va.: Capt. Benjamin Munday, asst.-surgeon U. S. A., from Jacksonville, Fla., Lieut. Powell C. Fauntleroy, asst.-surgeon U. S. A., and Acting Asst.-Surgeons W. H. Prescott and Raphael A. Edmondston from Camp Wikoff, Montauk Point, L. I.

To duty with troops at Anniston, Ala.: Lieuts. and asst.-surgeons U. S. A., Henry A. Webber to the 1st U. S. Inf. and Edward T. Schreiner from the General Hospital, Fort McPherson, Ga., to the 2d U. S. Inf. Acting Asst.-Surgeon Peter Beckman to duty with the 2d U. S. Inf., and the following acting asst.-surgeons to report to the commanding general: Frank G. Jones and Charles F. Woodford from Washington, D. C.; Rufus D. Boss from Camp Wikoff, N. Y., and Pemberton Lundy from Buffalo, N. Y.

To the 7th Army Corps at Jacksonville, Fla.: Major Ezequiel de la Calle Delgado surgeon, U. S. V. from New York City, N. Y., and Acting Asst.-Surgeons, Vernon J. Hopper, Henry B. Stotter and Benjamin A. Kittrell from Washington, D. C.

To Santiago, Cuba, via New York City: Louis A. Moloney, acting asst.-surgeon from Cincinnati, Ohio, and Acting Asst.-Surgeon Edward R. Bragg from Camp Wikoff, N.Y.

To Ponce, Porto Rico: Major Louis Brechemin, surgeon U. S. A., and Acting Asst.-Surgeons Charles S. Stern from Camp Geo. H. Thomas, Chickamauga, Ga. Capt. Frederick P. Reynolds, asst.-surgeon U. S. A., and Acting Asst.-Surgeon John W. Wright from Fort Monroe, Va., his previous orders to Santiago having been countermanded.

To Havana, Cuba: Lieut.-Col. R. M. O. Reilly, chief surgeon U. S. V., as a member of a board under orders from the Secretary of War, and Acting Asst.-Surgeon Joaquin L. Duenas from Philadelphia, Pa., to duty with the board to select camp sites.

On sick leave: Major Philip G. Wales, brigade surgeon U. S. V. from Camp Wikoff, N. Y.; Major Peter D. McNaughton, brigade surgeon U. S. V., Major Charles B. Ewing, brigade surgeon U. S. A. from Camp Geo. H. Thomas, Ga.; Capt. Geo. M. Wells, asst.-surgeon U. S. A.; Capt. Chas. F. Kieffer, asst.-surgeon U. S. A. from Camp Wikoff, N. Y.; Capt. George H. Wuchter, asst.-surgeon 8th Ohio Inf.; Capt. O. B. Weed, asst.-surgeon 32d Mich. Inf.; Lieut. Thos. S. Kirkpatrick, asst.-surgeon U. S. A. from Santiago, Cuba, and the following acting asst.-surgeons: Peter M. Beckman, Geo. I. McLeod, Wm. E. Stemen and James S. Kennedy from Camp Wikoff, N. Y.; Major Marshall W. Wood, surgeon U. S. A.; Majors and Brigade Surgeons U. S. V. William B. Bannister, Guy L. Edie and Frank Bruso; Major W. C. Gorgas, surgeon U. S. A.; Major F. D. Bain, surgeon 2d Ohio Inf.; Lieut. Cassius C. Hogg, asst.-surgeon 1st West Va. Inf., and Acting Asst.-Surgeon John E. Bacon.

To be examined for promotion: Wm. W. Quinton, Thomas S. Bratton Deane C. Howard, Wm. H. Wilson, James M. Kennedy and Guy C. M Godfrey, asst.-surgeons U. S. A.

Resigned: Capt. A. J. Pedlar, asst.-surgeon 1st Batt. Cal. Heavy Art.; Lieut. Rowland B. Robinson, asst.-surgeon 1st R. I. Inf., and Lieut. Stephen J. Keefe, asst.-surgeon 3d N. J. Inf.; Major Charles C. Foster, surgeon 5th Mass. Inf.; Capt. B. H. Kitrell, asst.-surgeon 1st Miss. Inf.; Capt. Ira B. Ladd, asst.-surgeon 7th Cal Inf.; Capt. Seth S. Ulrich, asst.-surgeon 1st Md. Inf.; Lieut. James R. McCausland, asst.-surgeon 1st Del. Inf.; Lieut. C. William Newton, asst.-surgeon 10th Ohio Inf.; J. Wilson Poucher, asst.-surgeon 20ist N. Y. Inf., and James N. McLean, asst.-surgeon 2d Ala. Inf.

Honorably discharged: Lieut.-Col. Benj. F. Pope (Major and surgeon U. S. A.) as chief surgeon volunteers only; Lieut.-Col. Rush Huidekoper, chief surgeon volunteers; Major Jabez N. Jackson, brigade surgeon volunteers; Majors Thos. Earle Evins and Lewis Schooler, chief surgeons volunteers; Major Wm. Arthur (Captain and asst.-surgeon U. S. A.) as chief surgeon volunteers only; Major Robert Burns, surgeon 1st New Hampshire Inf., to accept commission as brigade surgeon volunteers, and Lieut. John H. Gibbons, asst.-surgeon 3d U. S. V. engineers; Major Leonard B. Almy, chief surgeon volunteers, and Majors Milo B. Ward and Calvin H. English, brigade surgeons of volunteers.

CHANGE OF ADDRESS.

Brandenburger, L. A., from 2348 Hickory to 2900 Eads Avenue, St. Louis, Mo.

Bartlett, J., from 462 E. Division to 281 Oak Street, Chicago, Ill.

Caldwell, W. S., from Sioux Falls, S. D., to Freeport, Ill.

Caven, W. A., from South Side Hospt. to 2112 Fifth Ave., Pittsburg, Pa.

Cargen, W., from Newman Grove, Neb., to La Crosse, Wis.

Dulin, F., from 1234 So. 14th to 1082 Broadway, Denver, Colo.

Fisher, G. C., from 291 So. Lincoln to 343 Ogden Ave., Chicago, Ill.

Fritz, J. W., from 340 W. Main to 340 Winden Ave., Hartford, Conn.

Gordon, H. S., from Los Angeles to Westminster, Cal.

Grieger, H., from Cheesman Blk., to Station A, Box 353, Denver, Colo.

Hyrup-Pedersen, P., from Denver, Colo., to Laramie, Wyo.

Harnly, L. B., from Salida to 1349 California Street, Denver, Colo.

Hixson, H. M. T., from 718½ Adams to 588 Polk Street, Chicago, Ill.

Holmes, E. W., from 1525 Mt. Vernon Ave., to 1930 Chestnut Street, Philadelphia, Pa.

Kramer, S. P., from 111 E. 9th Street to Rockdale Avenue, Cincinnati, Ohio.

Klebs, A. C., from 4419 Indiana Ave., to 600 North State, Chicago, Ill.

Kimmons, S. H., from Fort Smith, Ark., to Tulsa, Ind. Ter.

Loeb, L., Claremont Bldg., to 6329 Woodlawn Ave., Chicago, Ill.

Lentz, A., from Rock Rapids to Larchwood, Ia.

Moody, H. F., from Baily Springs to 706 Government Street, Mobile, Ala.

Malster, R. M., from Omaha to Stromsburg, Neb.

Olsen, O. B., from Battle Creek, Mich., to 1926 Wabash Ave., Chicago.

Phillips, E., from Scranton to New Haven, Pa.

Piper, A. J., from Chicago to Austin, Ill.

Rietz, P. C., from Policlinic Hospt. to 905 W. 21st Street, Chicago, Ill.

Riley, C. M., from 510 Spruce to Barnes Medical College, St. Louis, Mo.

Searle, C. H., from Chicago to Sabula, Ia.

Schmidt, T., from 116 E. 9th Street to Court & Walnut, Cincinnati, Ohio.

Sandow, E. F., from Helena, Mont., to Honolulu, H. I.

Seton, W. H., from Baltimore, Md., to 27 West 84th Street, New York, N. Y.

Thomas, A. E., from 3148 to 3200 Indiana Ave., Chicago, Ill.

Wilson, G. H., from 176 Euclid to 154 Cedar Avenue, Cleveland, Ohio.

Wisman, L. J., from Ainger to 211 4th Ave., Peoria, Ill.

Waxham, F. E., from Denver, Colo., to 3533 Grand Boul., Chicago, Ill.

Yemans, C. C., from 529 Woodward Ave., to Ypsilanti Sanitarium, Mich.

LETTERS RECEIVED.

Allen & Hamburys, Ltd., New York, N. Y.; Applegate, J. C., Bridgeton, N. J.; Amos, W. F., Portland, Ore.; Ammonol Chemical Co., New York, N. Y.; Anderson, H., Medford, Wash.

Bromine-Iodine Chemical Co., Binghampton, N. Y.; Beck, H. I., New York, N. Y.; Broughton, R., Dwight, Ill.; Brandan, S. W., Clarksville, Tenn.

Caman, Geo. P., Concord, N. H.; Cassidy, W. W., Chicago, Ill.; Center, C. D., Quincy, Ill.; Chandler, W. J., S. Orange, N. J.; Cockerton, G. E., Danville, Ill.

Davis, B. B., Omaha, Neb.; Dorsey, F. B., Keokuk, Iowa; Dryden, Mary V., Battle Creek, Mich.; Deming, N. L., Ft. Wayne, Ind.; Donohue, M. J., Clintonville, Wis.

Elliot, H. G., New York, N. Y.; Eagleson, J. B., Seattle, Wash.; Egbert, J. Hobart, Holyoke, Mass.; Elliott, A. R., New York, N. Y.

Fuller's, Chas. H., Adv. Agency, Chicago, Ill.; Finlayson, D. W., Des Moines, Ia.; Fisher, Lewis, New York, N. Y.; Fassett, C. W., St. Joseph, Mo.; Fougera, E. & Co., New York, N. Y.

Gahm, Dr., Ellisville, Ill.; Garrett, G. H., Millers Grove, Texas; Greene, Chas. Lyman, St. Paul, Minn.

Hammond, A. B., Brockton, Mass.; Hill, W. H., Gentryville, Mo.; Humiston, Wm. H., Cleveland, Ohio; Hektoen, L., Chicago, Ill.; Hummel A. L., Adv. Agency, New York, N. Y.; Hughes, C. H., St. Louis, Mo.; Hutchinson, Woods, London, Eng.

Inglis, David, Detroit, Mich.

Jackson, Jas. J., Dansville, N. Y.; Jenks, H. D., Detroit, Mich.

Karger, S., Berlin, Germany; King, G. W., Penileton, Ore.; Kelley, J. S., Syracuse, N. Y.

Lownes, L. M., Norristown, Pa.; Leedy, C. E., Pierceton, Ind.; Loomis, J. F., Independence, Ky.; Lehn & Fink, New York, N. Y.

Murphy, J. B., Chicago, Ill.; Murnan, J. R., Covington, Ky.; McReynolds, J. D., Dallas, Texas; Matthews, F. B. Jacksonville, Fla.; Morrison, E. E., Great Bend, Kan.; McKinney, R., Memphis, Tenn.; Marchand, Chas., New York, N. Y.; McBride, M. A., Sidney, Texas; Myers, I. A., Shelby, Ohio; Mastoin, E., Bruxelles, Belgium; McLean, T. N., Elizabeth, N. J.

Potts, Mrs. R. D., San Francisco, Cal.

Reed, C. A. L., Cincinnati, Ohio; Rio Chemical Co., St. Louis, Mo.; Reed, R. Harvey, Rock Springs, Wyo.; Rittenhouse, H. H., Chicago, Ill.; Rosenthal, Edwin, Philadelphia, Pa.; Robertson, John, Cincinnati, Ohio.

Stark, H. H., Sullivan, Ind.; Stevens, C. L., Athens, Pa.; Solomon, L. L., Louisville, Ky.; Stallman & Fulton, New York, N. Y.; Seibert, W. H., Steelton, Pa.

Tobias, A. W., Elwood, Ind.

Van Houghton & Ten Broeck, New York, N. Y.; Vinsonhaler, F., Little Rock, Ark.

Woody, S. E., Louisville, Ky.; Work, J. A., Elkhart, Ind.; Walker, H. T., W. Dubuque, Ia.; Woldert, E. A., Philadelphia, Pa.; Williams, C. H., Boston, Mass.